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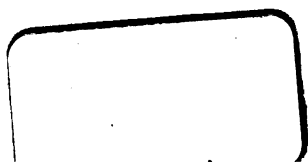
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PROCEEDINGS

OF THE

United States Veterinary
Medical Association

SESSION OF 1898

EDITED BY THE PUBLICATION COMMITTEE

W. L. WILLIAMS, CHAIRMAN

CORNELL UNIVERSITY, ITHACA, NEW YORK.

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Rhodes, W. L., Lansdowne, Pa.
Richards, W. H., Emporia, Kan.
Ridge, Wm. H., Trevoise, Pa.
Robert, J. C., Agricultural College, Miss.
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Ryan, J. F., 2525, Indiana Ave., Chicago, Ill.
- Salmon, D. E., Department of Agriculture, Washington, D. C.
Saunders, Charles, Eldorado, Kan.
Saunders, R. J., Salem Mass.
Schaefer, Valentin, Tekamah, Neb.
Schaffter E. P., 8 Bolivar St., Cleveland, Ohio.
Scheibler, J. W., 310 3d St., Memphis, Tenn.
Schoenleber, F. S., Morris, Ill.
Schwartzkopf, Olof, Flushing, N. Y.
Shaw, Walter, 18 N. Ludlow St., Dayton, Ohio.
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Sprague, John D., David City, Neb.
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Stalker, M., Ames, Iowa.
Staples, S. B., Baton Rouge, La.

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Treacy, M. J., Fort Mead, S. Dak.
Trumbower, M. R., Monett, Mo.
Turner, J. P., Department of Health, Washington, D. C.
Turner, T. J., care of Kingan & Co., Indianapolis, Ind.

Vogt, A. G., 119 Plane St., Newark, N. J.
Voorhees, E. R., Somerville, N. J.

Walker, R. G., 95 Aberdeen St., Chicago, Ill.
Waller, H. N., East Liberty Stockyards, Pittsburg, Pa.
Walrath, J. A., 691 Quincy St., Brooklyn, N. Y.
Walrod, George M., Storm Lake, Iowa.
Ward, S. A., St. Cloud, Minn.
Waugh, J. A., 813 Forbes St., Pittsburg, Pa.
Weber, S. E., Lancaster, Pa.
Webster, R. G., Salem, N. J.
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Wende, B. P., Millgrove, Erie County, N. Y.
Wende, H. S., Cor. Adams and Seymore Sts., Tonawanda, N. Y.
Wheeler, A. S., Biltmore, N. C.
Whitbeck, S. S., Decorah, Ia.
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White, T. E., Columbia, Mo.
Whitmore, N. P., Gardner, Ill.
Whitney, Harrison, 20 George St., New Haven, Conn.
Wicks, A. G., 429 Liberty St., Schenectady, N. Y.
Wight, W. E., Delaware, Ohio.
Williams, W. L., Ithaca, N. Y.
Williamson, F. P., Velasco, Texas.
Winchester, J. F., Lawrence, Mass.
Wray, W. H., Carlton House, Fox Hill, Norwood, London, Eng.
Wright, J. M., 1639 Wabash Ave., Chicago, Ill.

Young, G. R., 1815 Chicago St., Omaha, Neb.
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Zucker, F. A., 256 Morris, Ave., Elizabeth, N. J.

MINUTES OF THE PROCEEDINGS
OF THE
United States Veterinary Medical Association
AT ITS THIRTY-FIFTH ANNUAL MEETING,
HELD AT
OMAHA, NEBRASKA, SEPTEMBER 6-7-8, 1898.

FIRST DAY—*Tuesday September 6th.*

Morning Session.—The thirty-fifth annual session of the United States Veterinary Medical Association, held at Millard Hotel, Omaha, Nebraska.

The Association was called to order at 10:45 A. M., the President Dr. D. E. Salmon, in the chair.

The President introduced the Hon. Frank E. Moores, Mayor of Omaha, who, with frequent interruptions by applause, extended a hearty welcome to the Association, emphasizing the sincerity of his words by presenting the President with the keys of the city, after which Dr. Roscoe R. Bell replied in appropriate words.

President Salmon then read his annual address, as follows :

PRESIDENT'S ADDRESS.

GENTLEMEN: The welcome that has been extended to this Association by the great city of Omaha, and the prospects for a large attendance of members and other representative veterinarians give promise that this thirty-fifth annual meeting will be one of the important historic points in the life of our organization.

Within the remembrance of some who are now present, the veterinary profession has developed from an apparently insignificant beginning in a few of the eastern cities until now its representatives are found in all sections of the country. There could be no better demonstration of this fact than the gathering here on the banks of the Missouri river of the many gentlemen, from the East and the West, from the North and the South, who will contribute to the interest and success of this meeting.

As the executive of this Association, I congratulate you upon the knowledge which we have just acquired, that we can meet here, in what many of us have considered a far Western city, and not only receive a cordial greeting but find ourselves surrounded by sympathetic members of our own profession. And I congratulate the citizens of this great State that there are located here so many competent veterinarians, whose lifework it is, not only to prevent and cure the maladies of the domesticated animals, but to guard the health of the people from the many diseases which they may acquire by contact with such animals or by consuming as food the various kinds of animal products. The veterinarian has evidently made a place for himself on these fertile prairies where horses, cattle, sheep and swine multiply in such profusion and develop in such perfection ; but he has just begun his work and the more his plans develop, and the better his efforts and aims are understood the more will he be esteemed and appreciated. In the closing years of this century, which has been so wonderful in scientific progress and achievement, there is nothing more remarkable than the influence which the study of animal diseases has had upon the advancement of human medicine, and the resources which the investigators of this subject have laid at the feet of suffering humanity. The elucidation of the nature of contagion ; the establishment of scientific disinfection ; the development of aseptic surgery ; the introduction of bacterial products, vaccines, animal extracts and antitoxins for the treatment of various diseases are well-known examples.

THE MICROBE OF CONTAGIOUS PLEURO-PNEUMONIA.

The study of the contagious pleuro-pneumonia of cattle has during the past year revealed a realm of life beyond the reach of the most powerful microscope. For years pathologists have searched for the microbe of this disease without success, and now we learn that their failure was largely due to the fact that this

microbe is so extremely small that even the perfect microscopes of the present day are not sufficient to enable the observer to make out its form and dimensions. The ingenious methods of investigation which were adopted in these researches appear to be free from flaws, and we must, therefore, accept the fact that there are living organisms far more minute than have heretofore been recognized ; and that, indeed, there is a world of life that the microscope is powerless to reveal just as we have long known of a world that our unaided vision could not detect.

The bearing of this discovery upon future researches is manifest. There are still numerous communicable diseases of which the active cause has escaped the search of our most able investigators. We have here another clew to these problems, and without doubt they will all finally be resolved by the perseverance and resourcefulness of the modern student.

VARIATIONS OF THE TUBERCLE BACILLUS.

The discovery by Dubard of tuberculosis in fish has served to broaden our views concerning this most interesting destructive panzootic disease. From a study of the bacillus of mammalian tuberculosis we learned that this microbe requires for its multiplication a temperature between 86° and 104° F., and we concluded from this fact that this germ is an obligatory parasite, unable to multiply outside of the animal body except under the special conditions furnished in the laboratory. Later, it was discovered that in the tuberculosis of birds, or avian tuberculosis, the bacillus had undergone a remarkable physiological modification and that it is able to grow all the way from 77° to 133° F. That is, instead of being confined to a temperature range of 18° F., as is the case with the mammalian bacillus, it has in the avian variety acquired the power to multiply through a temperature range of 36° F. The doubling of the temperature range and the ability to multiply at a point nine degrees lower on the scale has an important signification ; for, whereas a continued temperature of 86° F. is difficult to realize in nature, 77° F. for days and nights in succession is not infrequent in many parts of the country. Already, the question was suggested as to whether it is not possible for the bacillus tuberculosis to live and multiply in nature as a saprophyte.

Dubard's discovery of tuberculosis carp, the bacillus from which is able to grow from 50° to 98.6° F., is still more astonishing, and opens a field of possibilities so extensive that it is safer

to wait for the positive results of investigations than to speculate as to what may or may not be true. The facts already established are, however, most important. A bacillus which can vegetate at 50° F., can live as a saprophyte without difficulty, if it finds a proper-food supply.

The first question that suggests itself is as to the identity of these bacilli, which are so different in their physiological requirements. Are the mammalian bacilli, the avian bacilli and the piscine bacilli but varieties of the same species, convertible from one to the other, or are they specifically distinct? The researches which have already been made appear to warrant the conclusion that the avian and piscine bacilli may be given all the characteristics of the mammalian form by growing them for a sufficient time under proper conditions. Indeed, Dubard is of the opinion that the carp were infected by throwing into the stream in which they lived the excreta and sputa of a human patient affected with pulmonary and intestinal tuberculosis.

Wide, therefore, as is the gulf which separates the cold blooded carp from the mammalia, or the latter from the hyperthermic birds; remarkable as are the morphological and physiological differences shown by the bacilli from these different sources, we are forced to the conclusion that these differences are superficial, and that they vary with the conditions of environment, and that the tuberculosis of the fish, the mammal and the bird is one and the same disease. Accepting this conclusion that the mammalian bacillus may under certain conditions infect fish and be so modified that it has the vigor to grow at a temperature 36° F. lower than before; and that, on the other hand, it may infect birds and be so modified as to grow at a temperature 9° F. higher than before, should we not be conservative in adopting the views recently promulgated to the effect that the bovine and human bacilli are different varieties and that the human bacilli are incapable of affecting cattle? This question is one of great importance to the sanitarian and will no doubt receive your most careful consideration.

RECENT PROGRESS IN THE CONTROL OF ANIMAL DISEASES.

Much has recently been accomplished in improving and adding to the methods available for the control of a number of our worst plagues. It is not many years since Texas fever was one of the most dreaded diseases, both on account of its destructiveness and of the mystery connected with its origin and dissemina-

tion. At last this mystery has been cleared away and we are to-day in a position to formulate more efficacious regulations for preventing this disease than is possible in connection with most others. By regulating the traffic in cattle from the infected district during the warm season of the year ; by allowing them to be moved by rail only and for immediate slaughter during that season ; by segregating such cattle and disinfecting the cars in which they are transported, the losses from this disease in the Northern States have been reduced to an insignificant amount.

There, however, remained other problems pressing for solution. In the vast district in which this contagion is enzootic, comprising practically the entire area of six great States and one Territory, more than half the area of four other States, and important sections of two additional States and one Territory,—in this extensive district, vast numbers of young cattle are reared to be sold for grazing. It is very difficult as you will understand to confine the shipment of these animals to the short period of two months in the winter season. The magnitude of the interests involved is a continual menace to the quarantine regulations. Fortunately we can now see our way to disinfecting these cattle so that they can be safely shipped anywhere, at all seasons of the year, without conveying the contagion to other animals.

Although these southern cattle carry the microbe of the disease in their blood for months and years after they leave the infected district, nature has beneficently provided that under ordinary conditions it can only cause disease when transferred to other animals by a single species of external parasite—the southern cattle tick or *Boophilus bovis*. With this fact demonstrated, it only remained to discover a practical method of destroying these ticks upon the southern cattle at the time they passed out of the infected district. This, however, was much easier to propose than to accomplish. Many preparations have been suggested and it was reported that one of these when tried killed the ticks immediately and the cattle in fifteen minutes. Other mixtures had no effect upon either the cattle or the ticks. It may now be said, however, that in extra dynamo oil and sulphur we have a dip which kills the ticks with so little effect upon the animals that it can neither be objected to on the ground of financial loss or cruelty. There may be and doubtless will be further improvements made in the composition of the dipping mixture used for this purpose, but the point to be emphasized is that we *already* have a dip which may now be successfully used for this purpose.

There is but one other practical problem connected with the prevention of this disease, and that relates to the immunization of cattle that are taken into the infected district. You all know that the cattle of that district are immune, otherwise they would contract the disease and die. Doubtless they obtain their immunity by undergoing a mild attack of the disease while they are young, and, if so, why should we not follow the way pointed out by nature and artificially infect young animals that are destined for the Texas fever district? This has been successfully done and it has been shown that the artificially immunized animals were able to resist the disease when taken to the infected section of the country. The principle is thoroughly demonstrated, and it only remains to work out the details of the method, by determining the variations which are required according to the age and breed of the animals and the season of the year. We may, therefore, claim with complete justice that the veterinary profession of the United States has not only explained the mysteries of Texas fever but that it now offers adequate means for the prevention of this disease.

The infectious diseases of swine have long caused such enormous losses that the swine growers have been discouraged and many of them financially ruined, while even the Federal government has been greatly concerned on account of the destruction of property and the menace to an important item of the food supply and of the export trade. Veterinary science has had much to contend with before it could offer a practical and efficient solution of the problem of preventing these losses. It was necessary to consider the vast number of animals liable to the disease and the great extent of territory over which they are distributed; also the relatively small value of each individual and the fact that the losses are caused by two distinct diseases, each of which requires its own specific treatment, while the symptoms are so obscure that it is difficult in the field to distinguish one from the other.

Hygienic surroundings, isolation, disinfection, medical treatment, inoculation and vaccination were all tried without satisfactory results. In individual cases, benefit was undoubtedly derived from the intelligent application of these measures; but the proportion of failures was too great, the success was too uncertain and, as is to be expected under such circumstances, no general and systematic efforts were made.

Last year some experiments were conducted with the stamping out system, that is, by killing diseased and infected animals with a view to arresting the multiplication of the contagion. It

was shown by these experiments that it is possible to greatly reduce the losses by this radical method ; but it requires a large force of men to find all the infected herds in even a single State ; it requires a vast sum of money to compensate for the slaughtered animals ; and worse than all, the enforced slaughter and quarantine develops an opposition fatal to the rigid prosecution of this plan of operations over a large extent of territory.

There remained but one resource to which we could turn with hope in the present condition of science. That is the use of anti-toxic serum. The researches made in this direction have shown that it is possible to produce a serum that will immunize animals to both of these diseases, and that will also cure both. This treatment was first tried with small animals such as rabbits and guinea pigs in the laboratory, and, being successful there, was tested late last year with herds of infected swine. Of about 250 animals in infected herds, over 75% were saved, while in herds not treated 85% died. This year, the results, with about the same number of animals have been even better and the prospects are that over 80% of the animals in infected herds may be saved by this method. Considerable quantities of serum will be used before winter, and we shall soon know definitely what results can be depended upon.

In antitoxic serum we have a most valuable agent for the control of swine diseases, but it can best be used under professional supervision. The State should regard it as an invaluable addition to its resources for eradicating the disease from our territory. If its application is left to the individual farmer, some will use it, but many more will neglect it ; and swine diseases will continue their ravages with slight abatement. If the State adopts it and provides for its systematic use wherever the infection appears, and requires the disinfection of stock yards and stock cars, it will not be long before swine can be raised with safety and profit, and the fifty or one hundred million dollars which are now annually blotted out by this scourge, will go into the pockets of our farmers increasing the wealth and prosperity of the nation.

THE ARMY VETERINARIAN.

You will learn from the report of the Chairman of the Committee on Army Legislation, that nothing has been accomplished towards the organization of a proper corps of commissioned veterinarians for service in the army. The Chairman of the Committee on Military Affairs has been favorable to the necessary legislation,

but the War Department has persistently objected, and has prevented the accomplishment of this reform which has been urged for so many years by this Association. Is it not incredible that in this practical and up-to-date country the War Department should insist upon being behind all other civilized nations in its organization and equipment of this branch of the service? Why do those who control that Department object to skilled, interested and responsible officers whose duty it would be to examine and pass upon the millions of dollars worth of horses that are purchased, and upon the other millions of dollars worth that are condemned as unfit for service? Why do they object to responsible experts who would have the authority to secure proper medicines and instruments for the treatment of sick and disabled animals, and to direct humane and intelligent treatment?

I shall not attempt to answer these questions in this address, but as the press and people of the country are asking for information as to why the same Department is antiquated and inefficient in some other respects, it is possible that Congress may yet undertake a reorganization on modern lines. When that time comes, let us hope that among other practical features there will be given to the army a commissioned veterinary service that will not only insure honesty, economy and intelligence in the purchase and treatment of animals, but that will give the veterinarian, and his family the same prospects of a pension in the case of injury or death that are enjoyed by other classes regularly connected with the military organization.

CHANGE OF NAME.

You will have an opportunity at this meeting to vote upon a proposition to change the name of this Association from the United States Veterinary Medical Association to the American Veterinary Medical Association. This proposition is in line with the growth and development of this body. There are without doubt some disadvantages connected with an enlargement of the field which we represent but these will probably be more than counterbalanced by the wider range of our vision and the nearer approach to a cosmopolitan character. The practicability of the plan is indicated by the success of the American Public Health Association which embraces the United States, Canada and Mexico, but there are some reasons why we should not act without careful deliberation. I trust the matter will be thoroughly considered before action is taken.

THE PRESIDENTIAL TERM.

There is, also, a proposition to be voted upon to increase the presidential term from one year, as at present, to two years. I regard this proposition as ill-advised and undesirable. We have had numerous members of this Association who should have been honored with the presidency but for whom the opportunity has never come. If we double the length of the term, we lessen by 50% the chances of every member to gain this distinction which should be coveted by all. Again, there are worthy members who would like to be president for one year, but who do not feel that they can give the time required by a term of two years. Why should we change the policy of the Association and insist that no member can be elected president unless he serves for two years? Finally, if a president is so efficient in the discharge of his duties that the Association desires to avail of his services for two years, and he is willing to serve for that length of time, it is a very simple matter to re-elect him. These considerations lead me to express the hope that this proposed amendment to the constitution will not carry.

THE WORK OF THIS ASSOCIATION.

Gentlemen, this Association still has a great work before it. Much of the field of animal diseases in this country has never been explored. Concerning the diseases that have been long known and studied, there is still much to learn. We are in the midst of a great public, which is ignorant of the principles of medicine in general, and particularly ignorant as to animal diseases and their influence upon the health and wealth of the nation.

The work of this Association must be principally of an educational character. It should begin with its own members, encourage them to study, to think and to write. It should particularly encourage original observation and investigation. It should use its influence to keep the veterinary literature of the country—the journals, the text books, and the official reports—abreast with the times and equal if not superior to any that are issued in any other country. It should also be active in educating public sentiment.

The citizens of this country, as a body, can be trusted to do the right thing if they thoroughly understand any question. If they have interfered with our work and in some instances apparently turned the hands backward on the dial of progress, it is because the educational work has been neglected, or through a

lack of discretion, prejudice and personal feeling have been aroused. Convince the people of the various municipalities that we are laboring to save their property and to protect their health, and it will be strange indeed if we meet with opposition.

The great system of meat inspection, now happily inaugurated, should be carried to perfection, so that the consumer can buy a piece of meat in any market in the country knowing that it has been inspected and that it did not originate from an animal diseased, injured or otherwise unfit to furnish wholesome food.

A system of milk inspection should be developed which will guard against filth, the germs of tuberculosis, typhoid fever and other communicable diseases, and which will make it possible to drink a glass of milk in our cities without serious misgivings as to its effect upon our health.

The animal plagues which now ravage the land, tuberculosis, hog cholera and swine plague, Texas fever, glanders, sheep scab and rabies should be rigidly controlled and eradicated.

More attention should be given to the treatment of the ordinary sporadic diseases so that the veterinarian shall be prepared at all times to give the animal of his client the best treatment which the present condition of science will permit.

To accomplish all of this program will require years of work, but it is your legitimate work. Individuals will come and go, but, as an Association, the illimitable future is yours. There is no task so great, no achievement so distant that its prospects need discourage you. Let us labor then systematically, with full confidence that in time all proper hopes shall be realized.

The Association then took a recess until 1:30 o'clock, P. M.

Afternoon Session.—The meeting was called to order by President Salmon, and the roll was called for. On motion of Dr. Williams, this was omitted, and the Secretary instructed to obtain a list of the members present by other means.

The register of attendance shows the following were present :

MEMBERS—Ayer, Baker, Bell (R. R.), Bown, Bray, Brenton, Cary, Clement, Connoway, Cotton, (T. Bent.), Day, Dunphy, Edwards, Forbes, Gould, Griffith, Heitzmann, Hinman, Hoskins, Hunter, Jameson, Johnson, Kelly, Knowles, Law, Lowe, Mc-Birney, Merillat, Miller (J.), Mitchell, Nelson, Norton, Pearson, Peters (A. T.), Ramacciotti, Reynolds, Salmon, Stalker, Stewart, Walrod, Whitbeck, White (T. E.) Williams.

MEMBERS-ELECT—Drs. Anderson, Beechy, Christmann, Cotton (C. E.), Drasky, Evans, Gibson, Griffith, Nighbert, Shaefer, Sprague, Taylor, Ward, Young.

VISITING VETERINARIANS—*Colorado*: A. J. Savage, Colorado Springs. *District of Columbia*: C. B. Robinson, Washington. *Illinois*: L. W. Young, Chicago. *Iowa*: John E. Brown, Oskaloosa; B. Fisher, Creston; W. R. Fullarton, Dubuque; H. M. Gillian, Mason City; R. R. Hammond, Lemars; S. K. Hazlet, Oelwein; J. C. Hinkley, Odebolt; W. G. James, Shanandoah; S. H. Johnson, Carroll; P. O. Koto, Forest City; E. H. Miller, Harlan; J. J. Miller, Sioux City; S. T. Miller, Shelby; F. M. Roys, Manning; G. A. Scott, Independence; L. U. Shipley, Sheldon; J. O. Simcoke, Stuart; C. E. Stewart, Chariton; H. L. Stewart, Oakley; H. E. Talbot, Des Moines; James Vincent, Shanandoah; A. C. Woods, Council Bluffs. *Kansas*: J. H. Cock, Ottawa; G. R. Conrad, Sabetha; C. B. McClelland, Lawrence. *Missouri*: L. R. Brown, Hamilton; H. M. Burgess, St. Joseph; W. A. Heck, St. Joseph; J. C. Milnes, Kansas City; A. B. Wilmoth, Chillicothe; James Wilson, St. Joseph. *Nebraska*: A. M. Blackwell, Omaha; A. Bostrom, Minden; A. T. Bowers, Hastings; J. W. Byers, Osceola; S. E. Cosford, So. Omaha; J. Haggerty, Lapeer; B. C. Langford, Tekamah; Chas. A. McKim, Norfolk; W. A. Thomas, Lincoln; Geo. P. Tucker, Lincoln. *Pennsylvania*: J. C. Foelker, Allentown; W. P. Phipps, Lionville; T. J. Phipps, Lionville; B. H. Underhill, Media. *Wisconsin*: R. S. Herr, Platteville.

LADY VISITORS—*Illinois*: Mrs. L. A. Merillat, Mrs. Harold Sorby, Misses Alma Peters and Martha Peters, Chicago. *Iowa*: Mrs. J. I. Gibson, Denison; J. C. Hinkley, Odebolt; G. A. Johnson, Sioux City; P. O. Koto, Forest City; D. H. Miller, Harlan; S. S. Whitbeck, Decorah; J. M. Walrod, Storm Lake. *Kansas*: Mrs. S. Stewart, and Miss Belle Stewart, Kansas City. *Missouri*: Mrs. John Forbes, St. Joseph; T. E. White, Columbia. *Nebraska*: Mrs. Don C. Ayer, Omaha; C. M. Day, Lincoln; J. J. Drasky, Crete; A. T. Peters, Lincoln; and Miss Mary Mann, So. Omaha. *Pennsylvania*: Mrs. W. P. Allen and Mrs. W. Horace Hoskins, Philadelphia. *Texas*: Mrs. T. A. Bray, El Paso.

OTHER VISITORS—W. P. Allen, Philadelphia, Pa.; V. C. Barber, Lincoln, Neb.; C. B. Knowles, Glenwood, Ia.; W. F. Knowles, James, Ia.; Harold Sorbey, Chicago, Ill.

PRESENT AS DELEGATES FROM OTHER SOCIETIES—Drs. P. O. Koto, Iowa State Veterinary Medical Association; Dr. J. C.

Foelker, Pennsylvania State Veterinary Medical Association ; Dr. J. I. Gibson, Iowa State Board of Health ; Dr. S. B. Nelson, Washington State Board of Health.

Upon motion of Dr. Hoskins, the proceedings as printed were substituted for the reading of the minutes of the last annual meeting.

REPORT OF EXECUTIVE COMMITTEE.

The Executive Committee made the following report :

MILLARD HOTEL, 7 P. M., SEPT. 5, 1898.

The Executive Committee was called to order by President Salmon, in the absence of the Chairman, Dr. Tait S. Butler. Members of the Committee present : Drs. Hoskins, Lowe, Peters, Salmon, Stalker, Stewart and Williams. Members absent : Drs. Butler, Osgood, Rayen, Rayner, Reynolds and Turner.

President Salmon appointed Drs. Baker, Cary and Clement to fill vacancies on the Executive Committee, and named Dr. Cary as chairman.

The first business brought before the Executive Committee for consideration was the proposed amendments to the constitution and by-laws. It was moved to recommend that the name of the Association be changed from the United States Veterinary Medical Association to the American Veterinary Medical Association. The motion was seconded, and, after a good deal of discussion, it was moved by Dr. Hoskins to postpone consideration of the motion until the report of the Committee on Incorporation was received. Seconded and carried.

It was moved by Dr. Stewart and seconded by Dr. Hoskins, to unfavorably recommend the proposed change in the constitution to the effect that the President shall be elected for the term of two years, instead of one year, as at present. The motion was unanimously carried.

Moved by Dr. Lowe, and seconded by Dr. Clement, to favorably recommend the proposed amendment to change the annual dues from \$5 to \$3, the amendment to take effect immediately upon its adoption. Carried.

The charges of violation of code of ethics were now considered :

In the case of the charges against Dr. S. K. Johnson it was moved by Dr. Clement, and seconded by Dr. Baker, to recommend his expulsion for violation of the code of ethics. Carried.

After careful investigation of the charges preferred against Dr. J. H. Wattles, it was moved by Dr. Clement, and seconded by Dr. Williams, that we recommend the expulsion of Dr. J. H. Wattles for violation of the code of ethics. Carried.

In the case of charges filed against Dr. G. E. Griffin by Dr. M. J. Treacy, the Secretary announced that in view of the public statement of Dr. Griffin in the *American Veterinary Review* for January, 1898, that he did not authorize the advertisement upon which the charges were based, Dr. Treacy desired to withdraw the charges. After due discussion, it was moved by Dr. Williams, seconded and carried, that we recommend that the charges preferred be dismissed.

The resignation of Dr. M. A. Piche, H. J. McClellan, L. H. Hempleman, and G. T. Netherton, which were laid over last year, were next considered, and it was moved to recommend not to accept the resignations for the reason they were delinquent in dues. The motion was seconded and carried.

The Secretary announced the resignation of Dr. L. McLean, with the statement that his dues were not paid in full. It was moved by Dr. Williams, seconded by Dr. Clement, that we recommend that the resignation be not accepted. Carried.

The resignation of Dr. W. J. Straughan was next presented, and as he had not paid his dues, it was moved to recommend that his resignation be not accepted. The motion prevailed.

The following applications were carefully examined, and it having been found that the applicants were eligible to membership, it was moved and carried to recommend that they be elected members of the Association :

J. S. Anderson (M.D.C., C.V.C., 1894), Seward, Neb. Vouchers, C. M. Day and A. T. Peters.

Levi P. Beechy (V.S., Ont. V.C., 1894), Omaha, Neb. Voucher, Don C. Ayer.

A. E. Behnke (D.V.S., C.V.C., 1892), Milwaukee, Wis. Voucher, R. H. Harrison.

S. E. Bennett (D.V.M., Vet. Dept. Ohio State Univ., 1890), Kansas City, Mo. Voucher, S. Stewart.

W. N. D. Bird (D.V.S., K.C.V.C., 1898), Arkansas City, Kans.), Voucher, S. Stewart.

John S. Buckley (D.V.S., A.V.C., 1896), Care Armour Pkg. Co., Kansas City, Mo. Voucher, S. Stewart.

A. O. Cayley (D.V.S., A.V.C., 1891), Milton, Pa. Voucher, W. H. Ridge.

H. A. Christman (V.M.D., Vet. Dept. Univ. of Pa., 1896), 193 Eleventh St., Milwaukee, Wis. Voucher, Leonard Pearson.

P. D. Coffey (D.V.S., C.V.C., 1892), Wellman, Iowa. Voucher, T. A. Bown.

Charles E. Cotton (V.M.D., Vet. Dept. Univ. Pa., 1893), 113 Sixth St. So., Minneapolis, Minn. Voucher, M. H. Reynolds.

J. J. Drasky (V.S., Ont. V.C., 1894), Crete, Neb. Vouchers, A. T. Peters and C. M. Day.

Fred Evans (V.S., Ont. V.C., 1893), Grand Island, Neb. Vouchers, A. T. Peters and C. M. Day.

A. T. Everett (V.S., Ont. V.C., 1888), 21st and H St., South Omaha, Neb. Voucher, Don C. Ayer.

James I. Gibson (V.S., Ont. V.C., 1887), Denison, Iowa. Voucher, T. A. Brown.

Charles Gresswell (M.R.C.V.S., 1875), Denver, Colo. Voucher, A. T. Peters.

F. F. Hoffman (V.S., Ont. V.C., 1885), Brookville, Pa. Voucher, W. H. Ridge.

Harvey J. Kannal (M.D.C., C.V.C., 1894), Rensselaer, Ind. Voucher, J. R. Mitchell.

R. D. Martin (M.D.V., Vet. Dept., Harvard Univ.), Bridgeport, Conn. Voucher, Richard P. Lyman.

Frank C. McCurdy (V.M.D., Vet. Dept., Univ. Pa., 1893), 1315 Broadway, Kansas City, Mo. Voucher, S. Stewart.

Chester Miller (V.S., Ont. V.C., 1893), 1124 N. Park Place, St. Louis, Mo. Voucher, T. A. Bown.

John R. Mohler (V.M.D., Vet. Dept., Univ. Pa., 1899), Cate Plankington Pkg. Co., Milwaukee, Wis. Voucher, Leonard Pearson.

H. G. Moore (D.V.M., Vet. Dept., Iowa Agr. Coll., 1895), 229 Eleventh St., Milwaukee, Wis. Vouchers, S. Stewart and M. Stalker.

M. M. Poucher (V.S., Ont. V.C., 1893), Oswego, N. Y. Voucher, Wm. Henry Kelley.

John J. Repp (V.M.D., Vet. Dept., Univ. Pa., 1898), 3608 Pine St., Philadelphia, Pa. Vouchers, W. H. Ridge and W. Horace Hoskins.

Valentin Schaefer (D.V.S., C. V. C., 1891), Tekamah, Neb., Vouchers, H. L. Ramacciotti and Wm. Herbert Lowe.

W. A. Schoults (V.S., Ont. V. C., 1892), Gladstone, Manitoba, Voucher, W. J. Hinman.

Thomas E. Smith (V.S., N. Y. C. V. S., 1897), 309 Barron St., Jersey City, N. J. Voucher, J. Payne Lowe.

John D. Sprague (M.D.C., C. V. C., 1894), David City, Neb. Vouchers, A. T. Peters and J. C. Norton.

Ray J. Stanclift (D.V.M., N. Y. S. V. C., 1898), Americus, Ga. Vouchers, James Law and W. L. Williams.

Wm. M. Taylor (V.S., Ont. V. C., 1888), York, Neb. Vouchers, A. T. Peters and C. M. Day.

Wm. Thompson (M.D.C., C. V. C., 1894), Exchange Bldg., Stock Yds., Sioux City, Ia. Vouchers, C. M. Day and A. T. Peters.

W. J. Tomlinson (D.V.S., A. V. C., 1887), 320 Mulberry St., Williamsport, Pa. Voucher, W. H. Ridge.

S. A. Ward (V.S., Ont. V. C. 1894), St. Cloud, Minn. Vouchers, M. H. Reynolds and C. C. Lyford.

G. R. Young (D.V.S., C. V. C., 1887), 1815 Chicago St., Omaha, Neb. Vouchers, Don C. Ayer and A. T. Peters.

The Secretary presented the application of Dr. G. Ed. Leech for reinstatement. Dr. Leech having paid the dues in full to the date of his suspension, it was moved and carried to favorably recommend his reinstatement.

On motion the committee adjourned.

S. STEWART,
Secretary.

On motion of Dr. Hoskins, the report of the committee was received.

Dr. Hoskins moved that the meeting take up the several recommendations of the Executive Committee separately and act upon them. Seconded and carried.

The several recommendations of the Executive Committee were separately considered and concurred in, and on motion the report was adopted as a whole.

Dr. Lowe moved that the rules be suspended, and the Secretary be instructed to cast the ballot of the Association for the gentlemen whose names were reported upon favorably by the Executive Committee. Seconded and carried. The Secretary cast the ballot of the Association for these applicants, and the President declared them duly elected to membership.

The Secretary announced that the Finance Committee had not been able to complete its report, and desired further time. There being no objection, the request was granted.

The Committee on Publication made the following report through its chairman, Dr. Williams :

REPORT OF THE PUBLICATION COMMITTEE.

Mr. President : Your Committee on Publication begs to report that the pledges made at Nashville were substantially kept. The report was mailed to the members in about forty-five days after the meeting.

For the present meeting similar plans to those carried out at Nashville have been adopted, and equally prompt issuance of the report is expected.

The contract for printing work has been let on more favorable terms than last year, our printing costing 90 cents as against \$1.03 per page in 1897.

Inquiry showed that by binding all our reports in cloth, and omitting gilt top, the work could be done at 18 cents per copy, as against 50 cents in previous years. Or, upon the basis of a 300-page report, the printing and binding in cloth will cost \$1.14 per page bound, as against \$1.03 per page unbound in 1897, or \$1.33 per page unbound in 1896. We have therefore arranged to bind all copies in cloth.

Respectfully submitted,

W. L. WILLIAMS (Chairman),
ROSCOE R. BELL,
S. STEWART.

Dr. Baker moved that the report of the committee be received. Seconded and carried :

DR. WILLIAMS : Closely allied to the work of the Publication Committee is that of the Librarian or Custodian, and there is no place set aside for his report. Would you like to have it now ?

PRESIDENT SALMON : Unless there is objection, you may read it now.

Dr. Williams here read the report of the Librarian as follows :

REPORT OF THE LIBRARIAN.

Mr. President : I beg to report that soon after my election as Librarian I received from ex-Secretary Hoskins and Secretary Stewart a long list of Association documents, largely Secretaries' records and expense vouchers, financial statements, etc., which were duly receipted for and placed in a comparatively fireproof room in the building of the New York State Veterinary College. The room is free from dampness, comparatively free from dust, and the documents are carefully wrapped and arranged.

I have also received, filed and distributed reports of the proceedings of our Association as follows :

YEAR	No. of Copies Received	No. of Copies Distributed	No. of Copies On Hand
1890	82	22	60
1891-2	100	22	78
1893	118	21	97
1896	107	24	83
1897	143	36	107
	550	125	425

The 125 distributed copies were disposed of as follows :

	1890	1891-2	1893	1896	1897
Free to librarians and boards of health.	16	15	15	18	16
Free to Pub. Co. for its use	1	1	2	1	4
" " medical journals.	-----	-----	-----	-----	12
" " other parties.	-----	-----	-----	-----	3
Buyers (sets 90, 91-2, 93, 96)	-----	-----	-----	-----	1
To new members.	5	5	5	5	-----
	22	21	22	24	36
Total for five years.	-----	-----	-----	-----	125

Your Librarian has made an effort to distribute these volumes remaining on hand, with the result that but 23 per cent. has been used. Notification was sent to each veterinary college offering a complete set to each, wishing it for their libraries, free, which disposed of 11 copies for each year. Members elected in 1897 were offered sets as far as published at \$1 per set, and five members availed themselves of the opportunity. Evidently our reports are printed in greater quantity than our needs demand. I respectfully recommend that the remaining copies, except 20 of each year be offered free to new members, upon request, carrying charges to be paid by recipient.

Respectfully submitted,

W. L. WILLIAMS,

Librarian.

On motion of Dr. Baker the report of the Librarian was received.

DR. CARY: Mr. President, in regard to the disposal of these excessive numbers, I think we should keep on hand at least

twenty copies of each year's proceedings for use in future years. There is such a thing in a society of this kind that back numbers of the proceedings are occasionally wanted by the officers or by the organization, and I therefore move that all in excess of twenty of each year's proceedings be distributed as suggested by the Librarian. Seconded and carried.

PRESIDENT SALMON : In order to get all short reports before the Association, the chair will not observe the order as printed in the programme, but will call for the report of the Committee on Army Legislation.

The Secretary read the report of the Committee on Army Legislation as follows :

REPORT OF COMMITTEE ON ARMY LEGISLATION.

Mr. President and Members of the United States Veterinary Association :

Another year has gone by, the Association has increased, the profession has advanced in knowledge and usefulness in all its various lines of work, save one, and that one has this year, owing to recent stirring events, been of momentous importance. It is needless to say I allude to the Army veterinary service. Year after year this committee has worked as best it could with the means at its command, and each successive year the same old story of failure, until the reports of this committee might have well assumed a regular stereotyped form.

Years ago, when our former President, Dr. Huidekoper, made such a gallant fight for an improved Army veterinary service, and was practically turned down by adverse reports of bureau chiefs of the War Department, he gave up the fight, and was of the opinion that nothing short of war would remedy this matter. Nevertheless, the Association has seen fit to continue its Committee on Army Legislation, and each year the committee would have the same experience as its predecessor. A bill would be prepared by the committee, acting in conjunction with several of the leading veterinarians of the Army. It would have the bill introduced in both the House of Representatives and the Senate. The bill was referred to the Military Committee of each of these bodies, where it would lie dormant. The legislative machinery would at last be set in motion and the bills would be sent to the War Department for a report. Here it would be

buried for two or three months, but your committee would have its persuasive power rewarded at last by getting an unfavorable report forwarded to Congress during the last few days of its session.

As the heads of the War Department bureaus were constantly changing, owing to promotions in the Army, our bill has had some wonderful experiences. The Secretary of War turned it over to the Assistant Secretary, who in turn referred it to the Commanding General, who would change his views at each session, favoring it or a modification of, at one time, and entirely disapproving it at another, the fate of the bill evidently depending on the mood of the general or the personal views of his aides, when it reached him. The adjutant-general is then asked for his opinion. This opinion is always prepared by some assistant adjutant-general, the adjutant-general signing the assistant's opinion. If it happened that his assistant had formerly been a progressive cavalry officer before being promoted to the staff and one who appreciated the veterinary profession, we would get a favorable report, such a one as was signed by Gen. Ruggles two years ago, this report having been prepared by Col. Hall, Assistant Adjutant-General, a cavalry captain. (See page 26, Proc. N. S. V. M. A., 1896).

The bill would then be sent to the Quartermaster General for report. This department has, under its authority, the purchase of all horses and mules for the Army, as well as anything relating to their food, care and treatment. Invariably the Quartermaster's Department made an adverse report. Especially was this the case two years ago, when Gen. Miles, being temporarily predisposed in our favor, recommended commissioning veterinarians as second lieutenants of the general staff and giving them authority in the purchase of horses for the Army, as well as their condemnation from the service. When this report reached the Quartermasters's Department, this department wished the position of army veterinary surgeon abolished, and a limited number of civilian veterinarians employed at the larger military posts at \$125.00 per month. This was the favorite idea in the War Department during the last administration. This scheme would make about twenty-five nice political plums to be dispensed by the administration. The position would have been a political one and the veterinarian could be removed at any time without cause, and the element so distasteful to our profession would have won a victory, and men who have devoted their best

years to the service and stood the vicissitudes of long Indian service on the frontier, would have been thrown upon the world in their old age.

When this modified bill was returned to the Military Committee of the House, Chairman Hull (J. A. T. Hull, Des Moines, Iowa), set it aside and the Committee favorably reported the original bill, giving veterinarians the rank, pay and all allowances of a second lieutenant, mounted, and the bill was put on the calendar, but Speaker Reed's retrenching policy prevented any action being taken by either House or Senate.

The same bill was introduced last winter, and went through the same course, but was pigeon-holed by the War Department until war was declared, and then returned to Congress disapproved. As the War Department had disapproved it, Chairman Hull absolutely refused to take any action whatever. Note this change of heart in less than a year. Not only did the War Department disapprove the bill to commission veterinarians, but it had the audacity to recommend their enlistment, giving each regiment of cavalry two, one ranking as sergeant-major at \$100 per month, the other to rank as quartermaster-sergeant at \$75 per month. Surely this was complimentary to a profession that has risen as has ours, to set it back forty years. Chairman Hull would not countenance any such a thing, as, once being enlisted, there would be no hope for future advancement.

Your committee repeatedly visited the War Department and urged the officials to recommend the veterinary bill; especially did we devote our energies on the Quartermaster-General, showing him the advantages to be derived from trained and educated veterinary officers in assisting his department in the purchase of horses.

I believe the necessity for a veterinary corps has never been brought before our leading generals in a proper light, and the formation of such depends on getting these high-ranking officers, or, at least, one of them, personally interested, and then the matter will be easy of solution.

The committee has not made a general call on the profession, as in the past years, to assist it by reaching their political representative, since we now recognize that all of this is lost ammunition unless the bill is favorably reported and put on the calendar.

During the war the army veterinarians were very active in their efforts to obtain recognition. A meeting of all the veter-

inarians encamped at Chickamauga Park was called on May 1st, at which a majority of the army veterinarians attended. We asked the War Department to increase our pay as was done in all other grades in the Army, and to give the veterinarians a pensionable status. This matter was urged by Gens. Wheeler, Sumner and Wade, who repeatedly asked the War Department to take some action, but all without avail.

A decision of the Commissioner of Pensions, addressed to your chairman May 23, was to the effect that veterinarians were not pensionable persons under the law, and the country would not assume any risks in their case. This placed the veterinarian in a very awkward position, and really made his position more undesirable than the private soldier who has some reward to look forward to in case of injury and sickness. The veterinarian is a non-combatant in the same sense as the army surgeon, save that the veterinarian has no protection whatever. If he was shot and so disabled as to render him valueless to his regiment, he would be condemned like a government mule and—not sold—but discharged. If he contracted any of the fevers and died, his widow and family would be absolutely thrown on their own resources.

He is the only person provided by act of Congress as part of a cavalry regiment to whom the country says, "Go to your duty. If you are killed or disabled for life, it's your affair, not ours." Surely this is a great injustice to our profession, and the Association can realize the position of about fifteen of its fellow veterinarians when orders came to the Army for the invasion of fever-stricken Cuba. In many cases where veterinarians had families depending on them their colonels advised them to resign rather than leave their families to the luck of war. In several cases the veterinarians resigned and entered other lines of work, when their services were most needed at the front. Most of the others contemplated resigning rather than go to Cuba, but were very fortunate in not having to do so, as the cavalry was ordered to Cuba dismounted, leaving the horses at Tampa. If ever there was a chance for the profession to cover itself with glory, it was during this war, but we were absolutely denied the opportunity. When one contemplates four million dollars being spent for horses and mules without any proper and adequate veterinary supervision, one wonders at the recklessness of such mismanagement. A glance at the ten thousand horses and mules in the great corrals at Tampa, Fla., would show any

competent and honest veterinarian that something was wrong in the present system. During the month of May from five to ten thousand animals were in this corral and not one veterinarian to treat them, and dozens were dying every day. Later on, one of the old non-graduate army veterinarians, a man past sixty years of age, was sent to this corral to save him from the terrible climate of Cuba, when the invasion was ordered. He was without authority, assistants, hospital and medicines, so his value to the corral can be imagined.

In closing this report your committee wishes to express its thanks to the Secretary of Agriculture, James Wilson, and to our honored President, Dr. Salmon, who have personally interested themselves in this matter of proper recognition of the profession, and yet they were unable to open the eyes of the War Department officials to the value of such a corps. It would seem as if Secretary of War Alger was favorably disposed, but was opposed by the same old bureau officials who have always opposed any innovation, especially anything so practical and economical as a trained, commissioned and honest corps of veterinarians. Your committee cannot offer many encouraging words to those of the Association who have worked many years for a veterinary corps in the Army of the United States, nor to those who have sacrificed their time and talents by serving in the Army and getting small pay, no promotion and mostly official abuse. If territorial expansion causes a reorganization of the Army on a modern basis, and this same expansion occurs in the intellects of some of our officials, we may live to see this committee discharged as good and faithful servants.

J. P. TURNER,

Chairman Committee on Legislation.

Dr. Baker moved that the report of the committee be received. Seconded and carried.

SECRETARY STEWART : Mr. President, I have an interesting letter from one of the Army veterinary surgeons, Dr. C. P. McMurdo, as follows :

FORT APACHE, ARIZONA, JULY 17TH, 1898.

To the Secretary American Veterinary Medical Association :

DEAR DOCTOR :—As it is impossible for me to attend the meeting of the American Veterinary Medical Association, I take the liberty of address-

ing you, and requesting that you have the kindness to bring the matter of legislation for the Army Veterinary Surgeons to the attention of the Association and endeavor to secure prompt and favorable action.

The present time, and the present war appear to be alike favorable to legislation in our interest, and I believe that a bill for our benefit could be gotten through Congress if we only have some one with influence and inclination to push it. Dr. Turner was doing very good work in our behalf, but is now, I think in Cuba and like myself (stationed in the mountains of Arizona) entirely out of range. It is manifest that neither officers of the Army, nor Veterinary Surgeons at remote frontier posts can do much towards influencing legislation, and hence we must look to our friends in the outside world for competent assistance.

The bill now before Congress is moderate and just in its provisions, and should really require no extraneous aid to secure its passage. The discrimination against us in this country in the matters of position and pay is sufficiently obvious and should have been remedied long ago. The passage of the bill above referred to will effect this remedy.

Some statement of the disadvantages under which we are placed, and the institution of a comparison between our position and that of the Junior Officers of the Army may be pertinent to this subject.

(1) Our pay is only \$900 per annum no matter what our professional standing and attainments may be, and this is wholly inadequate, especially at isolated frontier posts where living is much higher than in civilization.

A second Lieutenant of Cavalry receives \$1,500 per annum, with increase of 10 to 40 per cent. according to length of service.

(2) When changing station under orders we are allowed only five hundred pounds of baggage, including our professional books and papers, and we do not receive any allowance for mileage, while a second Lieutenant is allowed fifteen hundred pounds of baggage besides his professional books and papers which are transported at government expense, and he receives in addition seven cents a mile for his personal transportation. Two moves last year cost me \$635 or nearly three-fourths of my pay for an entire year.

(3) While we serve exclusively with mounted troops we are not mounted nor allowed forage for a horse, and so when we serve in the field we are either provided with a mount by the Quartermaster, who is not permitted to keep any horses that are fit for cavalry service, or else we must have recourse to the troop commander with the inevitable result of having the worst horse in the troop assigned to us, and such an animal as nobody else will ride. A second lieutenant of cavalry is allowed forage for two horses.

(4) We are not provided with quarters and in the majority of instances we are dependent on the courtesy of the post authorities for a house to live in, and even then any junior officer can "rank us out."

In all the European armies the Veterinary Surgeon is a commissioned officer, and thereby enabled to give his orders with authority and to command obedience and respect. We have no control over the farriers and other enlisted men who have no respect for anybody who does not wear shoulder-straps. The purchase and condemnation of public animals is assigned strictly to officers, with but little experience and no technical training or knowledge of the anatomy or physiology of the animal presented for inspection.

tion. A glance at any one of our regiments of cavalry will demonstrate this.

We have practically no drugs or medicines except such as can be found in the barn of any old farmer, such as soda, ginger, cayenne pepper, turpentine, etc., ingredients which were used in the crude and simple formulas of a hundred years ago.

Our instruments are equally crude, cheap, obsolete and worthless, but we are not permitted a choice in their selection or allowed to enter a word of protest.

This is the natural sequence of primitive conditions in the army at its organization when old farriers were appointed Veterinary Surgeons because regular graduates were not available. Now when regular graduates are alone eligible for appointment they are subjected to the same conditions and restrictions as the old farrier. The change and radical improvement in personnel has not led to any corresponding change in either material or social conditions. We contend that the superior education and attainments which are now essential qualifications to appointment should receive just and substantial recognition and that we should be established on the professional and social level to which the marked progress of veterinary science fairly entitles us.

This can be effectively and well done by the passage of the bill now before Congress and it is in the interest of the entire veterinary profession to push it steadily and successfully forward. Were our status established on the basis provided in the bill we should then be in a position to control such important matters as the selection of proper medicines, dressing and veterinary instruments, our prescriptions and general treatment, while corresponding to improved scientific methods would receive a wide and favorable recognition and the members of the veterinary profession in the military service would be placed in the definite, permanent and authoritative position of commissioned officers in the army.

C. D. McMURDO,

Jr. V. S. 7th. U. S. Cavalry.

Dr. Pearson, chairman of the Committee on Intelligence and Education, presented the following report :

REPORT OF THE COMMITTEE ON INTELLIGENCE AND
EDUCATION.

OMAHA, SEPTEMBER 6, 1898.

The report of the Committee on Intelligence and Education that preceded this one was made up principally of a review of the various veterinary schools of North America, and mentioned the principal changes that had been made in these schools during the period covered by the report. It also laid stress on the import-

ance of the periodicals of the profession as influences for education and progress, a subject that cannot be presented too strongly.

During the past year there have been but few changes in the equipments, faculties and policies of the veterinary schools. It does not seem necessary, therefore, to review the same field again at this time.

There is, however, one change that I have learned recently, an important change, and that is in reference to the veterinary department of the Columbian University. That University, I understand, has given up its undergraduate course and will in the future confine itself to a postgraduate course, and thus becomes the first exclusively postgraduate veterinary school in America, and, in fact, I believe, in the world.

The past three or four years has been a period of intense depression in the horse industry, and for much of this time all branches of the livestock industry have suffered. One result of this condition has been to lessen the demand for veterinary services in civil practice, to discourage veterinarians, and with reference to the schools, to restrict the size of entering classes.

But now the clouds of commercial depression have passed away and for more than a year the livestock industry has experienced a return of prosperity so complete that, in many branches, prices and profits have passed the high-water mark of the best of preceding years.

The hard times brought great inconvenience and even suffering, but they have served in part to sift out incompetent men and inefficient methods, so that now the live-stock industry rests on a firmer and more secure foundation than ever before. This condition seems to be best illustrated in the horse-breeding branch of animal husbandry. The whole business has undergone a reorganization. Instead of the old method that was so largely practiced, of breeding any kind of a mare to any kind of a horse, with the result that not one foal in ten could be marketed at a profit, it is now evident that horse-breeding is an art that requires the exercise of great skill and judgment, that sires and dams must be carefully and studiously selected, judiciously mated and that the foals cannot be successfully reared by the elements and by nature, but they must have intelligent care and handling. In short, haphazard methods are disappearing.

Similar changes are marking the other branches of the great industry, that it is the duty of the veterinarian to protect and

foster, and with the result that animals are improving, are becoming more valuable and veterinary services are in increased demand.

So far as possible, an attempt has been made to ascertain the conditions of veterinary practice during the past year. It is very gratifying to be able to report that the conditions of practice, both as regards volume of work and collections, have been better than for many years.

As there have been no unusual outbreaks of infectious diseases, this constitutes an unmistakable sign of prosperity. Indeed, several veterinarians of large and established practices have said that this summer has surpassed all others in the respects above mentioned.

These facts are presented here to show that the causes that have served to restrict the number of students at veterinary schools have ceased to operate and that the schools may now expect increased attendance. Many of the schools have been "lying close to the wind" for the past few years, in accordance with an avowed waiting policy. With the return of attendance, development may be expected and the trend of such development will have an important influence on the whole veterinary profession.

It is desired to call attention here to a few directions in which development is desirable. And this is not a question of interest to the prospective student and the schools alone,—it is of the greatest importance to the practitioner. As surely as a stream cannot rise above its source, just as surely is it impossible for the veterinary profession to advance beyond the standard set by its representative schools. And as schools lag behind and fail in their duty to their students, to the same extent do they fail in their duty to the profession at large and act as drags on all professional advancement.

It is evident that if the schools are to make good veterinarians, they must, above all things, begin with good material. The quality of the freshman is controlled principally by the matriculation examination. Therefore, this examination should be as rigid as is necessary to exclude men who are without enough preliminary education to enable them to grasp and understand the subjects taught and to become creditable members of our profession. The entrance examination should also be so high that it may not be necessary for the teacher to lower the standard of his class instruction, so that it may come within the reach of a

poorly trained or an undeveloped mind. There is no reason why entrance examinations to veterinary schools should not eventually be as high as they are for admission to the science courses in our best universities. But that such a change can only be made gradually is well shown by the experience of the schools in New York State. The tendency of all schools should be toward higher and higher entrance examinations.

Another suggestion is in relation to instruction in pathology. The course in pathology can scarcely be too thorough. This is by far the most difficult and, after the fundamentals, the most important subject in a veterinary course, as it is in the course in medicine. A man cannot be a good diagnostician if he is not a good pathologist; without good pathology he cannot be a good therapist, he cannot be any sort of a meat inspector and as an investigator he is out of place. In short, it is not too much to say that without a good course in pathology a school cannot educate a veterinarian who deserves the name. And how is pathology taught in the short term schools? I refer to the state examining boards or even to the catalogue of the institutions. One great difficulty here is in obtaining qualified teachers. Good comparative pathologists and teachers of pathology are rare. But the difficulty should be overcome in some way, and students should receive full courses in general and special pathology and pathological histology, demonstrations in morbid anatomy and drill in making post-mortem examinations.

Next, in regard to clinical instruction. No one doubts the need of a large amount of practical instruction, of direct, personal contact with domestic animals in health as well as in disease. Many young veterinarians are so deplorably weak in practice; in the application of their knowledge. Of course this defect can sometimes be made good after graduation, but it is a hard, slow process, when the start must be made from the bottom, and many fail. The system that prevails in some schools of assigning cases directly to members of the senior class, who thus become responsible for their progress and treat them under the supervision of the clinical professor, has much to recommend it.

Many other branches in which there is room for improvement might be pointed out, but those mentioned seem at present to be in greatest need of development.

But one more point will be considered at this time, namely: the need of broader tendencies in veterinary education. The field of the veterinarian is broadening rapidly in this country.

Much work and advice is required of him now in the fields that were not thought of even ten years ago. And the tendency is for the scope of veterinary work to expand. Without detailing these tendencies, it is enough to say that to be prepared to meet the multitudinous and momentous questions that will confront him, the future veterinarian must not only be skilled in comparative anatomy, physiology and pathology, and familiar with the diseases of *all* of the domestic animals, but he must also have a large fund of information in relation to animals in health, to animal husbandry, to breeding, rearing, feeding, and utilization of animals for all purposes. He must be more of an expert on animal industry,—an animal engineer.

As contrasted with this large view, this tendency and need, this real field of veterinary occupation, consider the old, narrow view of the veterinary profession. The development of our schools must be along lines as far in advance of the traditions of the past as the institutions that develop veterinarians are now in advance of those that turn out horse doctors.

LEONARD PEARSON,

Chairman.

Dr. Lowe moved that the report of the Committee on Intelligence and Education be received. Seconded and carried.

PRESIDENT SALMON: The next in order is the report of the Committee on Diseases.

Dr. Peters then presented his report as chairman.

EXCERPTS FROM THE REPORT OF THE COMMITTEE
ON DISEASES.

RABIES.

BY PROF. JOSEPH HUGHES, CHICAGO, ILL.

Rabies is a disease of very frequent occurrence here. During the past year I have personally known of about a dozen outbreaks among dogs and have had a chance to investigate one outbreak in a stable of horses where nine animals became affected and had to be destroyed. In this special outbreak no history of the animals having been bitten by a rabid dog or other animal could be found and no history of rabies having occurred in the immediate

vicinity of the stable could be learned. I found however that about two weeks previous to the first horse becoming affected, a rabid dog was treated one block distant from the stable which contained these horses. I also found on further investigation that one month prior to the disease appearing among the horses, another rabid dog had been in the neighborhood. The stable containing the horses was an open one, so that a dog could have free access to it and could bite any animal without his presence being detected. This was the most extensive outbreak amongst horses that I have seen in several years. Isolated cases are more or less numerous, probably two or three yearly appearing in the course of one's practice. The symptoms presented are nervous twitchings, more so of the ears and a tendency to seize hold of the stall or a stick passed towards them, sometimes seizing such stick with a terrible ferocity. This tendency ceases afterwards and gradually paralysis supervenes and the animals die in great agony. I have not seen any rabies in cattle or animals other than horses and dogs.

New York : Two outbreaks are known to have occurred, in which seven cattle and a number of dogs were affected and died. The outbreaks were in each case caused by a rabid dog. In the first outbreak two men were bitten. One took the Pasteur treatment in New York, and was not affected with the disease. The other paid no attention to the wound and died about one month later, supposedly of rabies.

Colorado : This year but one outbreak reported. This was at Colorado Springs, only five or six dogs having been infected by a rabid dog at large. During the past few years three other outbreaks among cattle and sheep are reported, probably infected by rabid coyotes or wolves. In all instances the reports were made by persons without scientific training, but sufficiently accurate description for diagnosis was made in two instances when thirty cattle and fifty sheep were affected.

Among the cattle and sheep on the range one or more outbreaks are reported yearly, due to coyote or wolf infection. The symptoms as reported are generally conclusive, and the outbreak is stamped out by the immediate destruction of the stock by the owner or neighbors.

Nebraska : One outbreak is reported in which four dogs and two calves died of rabies, also one dog from artificial inoculation. The following is a history of the outbreak : On November 15, 1897, a dog came to the farm of a Mr. Plotz near Germantown,

Nebraska. The dog seemed cross and was afraid, and fought with the Plotz dog until he was driven away. A neighbor caught him and tied him up. The dog was cross and snapped at those who handled him. He acted strangely for three or four days, at the end of which time he died. On the last of January the Plotz dog became affected and on the first of February visited the farm of John Beckman and was noticed fighting with a young dog belonging to Mr. Beckman. The Plotz dog was driven away and when home he acted strangely and somewhat vicious, snapping at things and even bit one of the children. He died four or five days after returning home.

The Beckman dog that was playing with the last named dog became affected on Feb. 12th. On the next day he seemed very lively and even vicious, biting two small children (but did not draw blood). He was then put out of the house when he went to the barn where he was found acting strangely, afraid and very vicious. The boy who caught him was bitten very badly on the finger (but through a mitten). The dog was then shut up and developed the same symptoms as the former ones, and died about Feb. 15th. The carcass was brought to Dr. John Anderson of Seward for a post mortem examination. Dr. Potter was called in consultation. The result of the post mortem was that rabies was suspected, and accordingly an emulsion was made of the spinal cord and injected into a dog on Feb. 16th. 60 m.m. were injected in the back of the left front leg. On March 9th, 29 days later he showed marked signs of uneasiness, gradually growing worse till he died on March 11th. Shortly after uneasiness began the dog bit the ground and sides of the enclosure, growling and snarling. The convulsions came on, at intervals between which he would bite and snarl at nothing or at things near him. At 2:15 on the day he died he was lying down, weak and restless, trying to get up occasionally, but unable to rise. He died about three hours later.

A dog belonging to a Mr. Kreuger was also bitten by the Plotz dog. In about four weeks signs of rabies were developed. He first was sick at the stomach, vomited, laid down and seemed unusually sluggish. He would chase the cattle but was not seen to bite them. He was then tied up. In three days he became cross and would snap at ducks and chickens at a distance even three to five rods away. He would snap at a short rope that hung to his neck and snapped at the fence surrounding him. Before death he frothed at the mouth, lost use of his hind parts,

and gradually grew weaker, but still snapped, even when too weak to raise his head. He died in a fit.

About April 1st Mr. Plotz lost a calf. It was sick four days and then killed. He was supposedly affected with rabies. Another calf, six months old, became affected about April 10th. On April 14th the pupils were dilated, he was standing in a crouched position, but not violent. He slobbered at the mouth, and when offered water it seemed as though he could not swallow. Defecation was accompanied with a short bellow. The anus was congested and some superficial blood vessels were bursted. He was easily attracted by a noise. The bellowing was about every fifteen minutes. The back seemed to sway. There was a tottering gait. The calf was destroyed and the carcass burned.

BY C. A. CARV, MEMBER OF THE COMMITTEE ON DISEASES.

Dr. Fenimore, of Knoxville, Tenn., says: "I have had two outbreaks of rabies in the last year. In one there were 9 horses and 3 cattle that died; in the other, two horses and about 20 hogs died. In both outbreaks the contagion was satisfactorily traced to rabid dogs."

Dr. Plaskett, of Nashville, Tenn., says that rabies is prevalent there; the dumb form is most common in dogs; the violent form appears occasionally in horses, cattle and dogs; it is usually transmitted by the dog; all cases die; no form of treatment has been successful with him.

Dr. Jolly of Atlanta, Ga., reports that he observes occasional cases of rabies and adds, "I believe it is certain that real rabies is rare."

The writer has observed three outbreaks of rabies during the past year, at or near Auburn, Ala. Two dogs were involved in the first outbreak. A two year old pointer became infected while away from home, probably by having been bitten by a rabid dog. This dog exhibited the violent form, some two or three weeks after he had strayed from home. At different times he seriously bit a small dog that was owned and that lived at the same place. The exact date when the small dog was first bitten is unknown; but about 21 days thereafter the small dog showed signs of violent rabies. Both dogs died in about 4 days after the first symptoms appeared. A post mortem was made in each case. The most characteristic lesions observed were hyperaemia of the mucous membrane of the pharynx, the stomach and patches in

the small intestine ; the liver was also congested or hyperaemic. Purgatives and nerve sedatives were useless in these cases.

The second outbreak appeared in July, 1898. A six or seven year old pointer became very nervous and restless on Friday evening. Without seeing the dog, I advised treatment for nervous form of distemper. During the next two days he developed a violent fighting dislike for pigs and dogs, and on Monday morning he escaped from his home and in less than one hour covered a distance of seven miles ; fought and whipped twenty-three dogs, some of which were bull-dogs and distinguished fighters. The pointer, previous to his rabid attack, was a peaceable and somewhat cowardly dog. In his round he bit a calf and possibly one cow ; he passed several persons without showing any desire to bite or interfere with them. Nearly all of the dogs he bit were at once killed. A Scotch collie pup that he bit very badly was thoroughly bathed with a 2 per cent. creolin solution within five minutes after it was bitten ; the pup at present shows no rabid signs ; the pup was still living September 4, 1898.

The rabid pointer lived four and one-half days after he became affected. He died in the night and was posted the next day after post mortem changes were quite well developed ; the most prominent lesions were hyperaemia of the liver and the mucous membrane of the pharynx, the stomach and the small intestine. In each case I searched the sinuses and cranial contents carefully for *lingulata tenoides*.

The third outbreak occurred about ten miles north of Auburn, Ala. Ten cattle, chiefly cows and calves, died during the latter part of July and the first part of August. A rabid dog had passed through that neighborhood about three weeks prior to the appearance of the first case among the cattle. The writer saw one of the affected cows and she exhibited the violent form of rabies.

The most important questions in connection with rabies are its cause, the symptoms and the characteristic pathological lesions. I think the cause must have some connection with the changes in the liver ; because the most constant post-mortem lesion that I have observed occurs in the liver. The liver in rabid cattle and dogs closely resembles the pale yellow liver in Texas fever. I have not tested this idea, but simply suggest it as a possible location of the cause of rabies. (See article in Centralbl. fur Bact., 1898, H. 18.)

Allow me to suggest that the Committee on Diseases for next year take up some single disease like rabies and devote the entire report to it. A concise description of the symptoms and pathological lesions is not to be found. The infectiousness of the meat and milk from rabid cows is in a measure undetermined.

OSTEOPOROSIS.

BY C. A. CARY, MEMBER OF COMMITTEE.

Dr. Fenimore of Knoxville, Tenn., reports : "Osteoporosis prevails here to an alarming extent. It used to be confined to the spring and fall, but now cases may be seen all the year."

Dr. Jolly, of Atlanta, Ga., says : "Osteoporosis is as common one time of the year as another. Mules are seldom affected ; Shetland ponies are very susceptible ; plain bred are more susceptible than well-bred, strongly developed horses ; successive cases appear in the same stable ; treatment, except in rare cases, is of but little avail ; a time at pasture proves nearer curative than any other means."

Dr. Plaskett, of Nashville, Tenn., reports osteoporosis as common in his city, but more common in the southern and western parts of his state. He finds it more frequently in young animals that have been neglected, but says it may occur in animals that are well cared for. He believes it is infectious because successive cases usually occur in the same stable. "Complete rest from labor and plenty of good food has produced complete recoveries in aggravated cases that had to be helped up."

The writer has observed 15 cases of osteoporosis during the past year ; the majority of these appeared at the Saturday free clinic in Auburn, Ala. Nine exhibited distinct symmetrical facial enlargement ; 11 were lame in the anterior limbs, most frequently in one or both shoulders ; 11 were lame in the hind limb, usually in the hip or stifle ; 8 showed stiffness in the loins ; 3 were unable to rise without aid : 4 had indented ribs ; 8 were rheumatic, exhibited shifting lameness ; and six had chronic indigestion. Of the 15 cases 5 were mares ; 8 were geldings ; 2 were mules ; 1 was three ; 5 were six ; 3 were seven ; 1 was eight ; 2 were nine ; and 3 were ten years old.

TREATMENT OF OSTEOPOROSIS.—I have had a few good recoveries by employing salicylate of soda, good food, good care

and moderate daily exercise. This treatment will require from 3 to 12 months. In some of these cases rough handling, exposure to bad weather, etc., will bring on a rheumatic attack. In fact, all cases that have apparently recovered are very liable to repeated rheumatic attacks when they are exposed to cold rains and cold nights.

A six year old black mare was brought to me two weeks after she began to show symptoms of osteoporosis. I kept her on a good pasture ; fed her on corn, oats, bran and good hay to tempt her capricious appetite ; gave her 2 to 4 dram doses of salicylate of soda three times a day and large doses of barium chloride per mouth once a week. This treatment was continued for six weeks, but the mare gradually grew weaker and stiffer until we were compelled to help her up every morning. Then I gave her intravenous injections of barium chloride once a week for four weeks. The morning following the first injection she got up by herself ; her appetite and condition improved so rapidly that at the end of three weeks she was in good flesh and showed no signs of lameness. One month after she had been removed to her home she was attacked with rheumatic lameness and has had several periodic attacks of lameness during the past eight or nine months.

A six year old gelding, having had osteoporosis for three months was given intravenous injections of barium chloride, once per week for six weeks. This horse was turned into a pasture during the treatment and left unprotected from the cold rains and cold nights of December and January. Finally the owner stopped bringing him to the hospital for treatment and the horse died two weeks later. This seems to be a case where exposure to cold, no care and poor feed defeated the test of intravenous injection of a barium chloride as a curative treatment for osteoporosis.

On the same day two cases of osteoporosis appeared at our Saturday free clinic for treatment. The first case was a poorly nourished gray gelding seven years old. He exhibited slight facial enlargement, an enlarged and lame shoulder, indented ribs, capricious appetite, tucked up abdomen, pulse and respirations normal and temperature 100.8 F. An intravenous injection of barium chloride produced profuse perspiration, some muscular and abdominal irritation and five evacuations of the rectum inside of 30 minutes. In one hour thereafter this horse appeared less stiff and ate grass greedily.

The second case was a poorly nourished six year old bay gelding that had been affected about eight months. He had a distinctly symmetrical facial enlargement, indented ribs, a tucked up abdomen, distinct hygromas at each stifle, appeared stiff in all the limbs and in the loins, appetite was poor, respiration and pulse normal, and the temperature was 102.2 F. I gave this animal the same treatment as was given the first case except I injected the barium chloride solution very slowly. In less than two minutes this horse was dead. The most prominent difference between these two cases was that in the first the temperature was about normal while in the second the temperature was two degrees above the normal.

A post-mortem examination was made immediately. The heart was found somewhat enlarged, empty and the ventricles contracted. The blood did not coagulate as rapidly as usual. The voluntary muscles would violently contract upon the slight-irritation. The articular cartilage of the shoulder, the elbow, the knee, the hip, the stifle, the hock and the fetlock joints exhibited ulcers varying in size from that of a pea to that of a twenty cent piece. These ulcers extended down to the cancellated bone. Some of the articulations were surrounded by a gelatinous exudate. The synovia was very thick, almost brown and excessive in quantity.

BY J. C. MEYER, JR., M.D., V.S. CINCINNATI, O.

Osteoporosis has been under my observation for twenty-five years, and though in all this time I have acquired but little knowledge as to the true nature of the disease I have, however, arrived at several positive facts. Osteoporosis is neither hereditary nor contagious. It is confined to urban and suburban districts, having failed to find a case turn up five miles beyond the city limits. If animals afflicted therewith are sent to the country they make either a partial or complete recovery and if they remain in a rural district and are not worked too hard, they will either die of old age, or of some other affliction foreign to osteoporosis. But if they are brought back to the stables where they contracted the disease, they in the course of a year or so will drift into the same ailment, though of a milder type. Some cases however may remain well for years after. Thus it is evident that our attention must be directed to factors operating in the locality (stables and surroundings) where the disease is generated. Feed, water, care and even breeds do not influence the development of the disease. Some years it seems to be more

prevalent than others, especially if the winter is severe, when stables are tightly closed cutting off the circulation of pure air. Most all cases can be traced to an unwholesome atmosphere, or gases arising from vaults, sewers, cellars, filthy streams or from a hollow space under the floor. This condition of affairs from a sanitary stand point make the suggestions of the veterinarian of inestimable value to an owner contemplating building or remodeling a stable.

Stables kept closed and artificially heated such as private stables, patrol and engine houses favor the development of the disease, particularly when lack of exercise or high feeding is the custom.

All breeds of horses are susceptible to osteoporosis. The thoroughbred who enjoys the very best of treatment is more exposed to it than the hard working draft horse that has barely time to eat his meals and rest himself; and the Shetland pony is particularly a victim, possibly attributable to his being pampered and confined.

The incubative stage of the disease is very irregular; it may extend from several months to several years; all owing to the virulence of the germ or the resisting power of the animal.

The symptoms are diversified and perplexing. The first indications are simply a decline in spirit and former thrifty appearance attended by a gradual loss of appetite and drawn up condition of the flanks. Some horses have an inclination to cut up the hay into lengths of 6 to 8 inches indicating a painful mastication; dressing of the molars affords no relief. When pressure is made along the alveolar cavities of the inferior maxillary bone pain is manifested by the horse elevating his head and opening his jaw. Upon closer examination an enlargement of the inferior maxillary is perceptible subsequently the superior maxillary bone becomes enlarged.

Another perplexing phase of this disease is an unaccountable sudden lameness as though some foreign substance has penetrated the foot. Upon removal of the shoe, the hoof pared and tested, no sign of any injury is visible. At the same time, upon pressure at the point of the frog a tenderness is often elicited unquestionably due to an inflammatory soreness of the underlying soft structure. To diagnose the character of this lameness it is necessary to take into consideration the history of the case and the above given symptoms. This is the principal form of lameness; there are, however, others. The hock is a favorite seat of disease,

attended by a general thickening and stiffening of that joint, in aggravated cases to such an extent that the animal requires assistance in getting up. This stiffness of the gait is often erroneously ascribed to lumbago and must be differentiated as the lumbar vertebræ do become involved in some cases, in fact fractures thereof are occasionally encountered. It is remarkable to note the friability of the osseous tissues of such subjects. Bones fracture upon the slightest provocation. A simple slip can occasion a fracture of the os innominatum. Fracture of the ribs is often met with in prostrate patients struggling for hours unable to rise, also in raising them by means of the slings. When a fracture of the os calcis occurs it takes place at the insertion of the gastrocnemius tendon the point of the bone forcing its way through the skin in some cases.

Again the readiness with which tendinous, ligamentous and periosteal tissues give way, in acute cases, is also a most peculiar phenomenon of this disease. This is what is commonly known as "breaking down." The usual location of such solution of continuity occurs from the knee or hock to the semilunar ridge of the os pedis.

It is the suspensory ligament that gives away most frequently; next in order comes the rupture of the perforans tendon at its terminal extremity and then the perforatus tendon at the pastern bone. In each case a portion of the periosteum and bone to which they are attached is carried with it. If a rupture be complete the ankle drops and the toe turns up. These lacerations may happen in one, two, three and even all the limbs within several days. Over-exertion in getting up, or a misstep during exercise are the direct causes of such "break downs."

Inflammation, swelling and suppuration usually follow. When suppuration supervenes it invariably takes place in the fetlock making it possible to insert the finger into the lower pastern joint. In these complicated cases the animals generally lie down the entire time; when they get up, which act is attended by excruciating pain and difficulty, they stand but a few minutes trembling all over the body very much resembling a severe case of acute laminitis. If they are not destroyed they become covered with bed sores and die of septicaemia.

On motion the report of the committee was received. The Association adjourned until Wednesday morning at ten o'clock.

SECOND DAY—*Wednesday, September 7th, 1898.*

Morning Session.—Association called to order by the President pursuant to adjournment.

The Chair announced the next order of business to be discussion of reports, stating the Association had before it the report of the committee on Intelligence and Education, and the report of the committee on Diseases, to which Dr. Bell responded as follows :

DISCUSSION OF REPORT OF THE COMMITTEE ON DISEASES.

Mr. President : I wish to say a few words relative to the report of the committee on Diseases, in regard to one of the remarks made by Dr. Cary, who states that instead of considering all the various contagious and infectious diseases, and of relying upon reports from various sources and turning it in to this Association as the condition of the diseases of this country, that the committee devote its attention to one or two diseases and make a thorough investigation, so that the report will be of some value instead of as it is apparently this year. For instance in Dr. Peters' report, which is evidently the result of a great deal of work and correspondence, on his part, it does seem that the statistics that he has obtained are of little value, for instance, he reports that in the State of New York there has been no Glanders during the past year ; he reports seven cases of tetanus and no cases of osteoporosis, and none of strangles. Without going into any details the report is simply ridiculous and it should not, I think, go into the archives of this Association.

For one who does not do any more practice than myself should make a better, a more accurate report. Instead of no case of osteoporosis it would read 50, 60 or 75. Two days before leaving for Omaha we had six in one of the stables of our city, and the owner said, "if these horses are diseased as you say, I killed two horses last week with the same disease." He only has nine horses in his stable.

As to the glanders I think it has been more prevalent in the last year than in a good many years. One stable I think lost nineteen in the city where I practice. So that in taking the report of no cases of this extremely prevalent disease, it seems to me that the report of the committee should not be accepted and put in the archives of this Association, but that the suggestion of Dr. Cary, that one or two diseases in which we are most inter-

ested be taken up, and thorough information obtained and put in the reports. I thoroughly appreciate that the committee has done any amount of work, but the results obtained, as shown in these reports, should make us all incredulous of accepting them.

DR. PETERS : Mr. Chairman, as chairman of that committee I am in hearty sympathy with Dr. Bell's remarks. In the circular letters that were sent out to the various members and to the resident secretaries of the several States, we tried in a measure to fulfil what Dr. Bell suggests. In that circular letter we printed the resolution that was passed by this society last year, and the committee thought that by printing that resolution, the gentlemen to whom those circulars were sent, would certainly send us reports on osteoporosis and rabies, but I am sorry to say that the reports on osteoporosis and rabies are very meager. In my introductory remarks yesterday, I stated that something ought to be done about this. I feel it very keenly that the report is not satisfactory. It is not satisfactory to myself, but it contained all the information that we could get, and as chairman I reported what I received. I hope that this convention to-day will do something to bring that committee into the right way and start it right.

SECRETARY STEWART : The committee was fully informed as to the action of this convention, in which it expressed itself to the effect, that the committee should confine its study to the two diseases named, and we regret that they did not succeed in carrying that study very far. The Association last year expressed its interest in the topics that were submitted to that committee. It was the expression of the Association then that the committee could profitably, with the aid of the members of this Association, work out something definite, an advancement along the line of knowledge concerning these two topics. It seem to me that can yet be done. I wish to say as Secretary, without any criticism of the committee, that it overlooked the necessity of time to bring about the careful study of this subject ; that the committee ought to have undertaken it earlier, and if it had done so, the committee could probably have secured the kind of information that would have been satisfactory to it, and helpful to this Association.

PRESIDENT SALMON : The chair would state from his own experience that it is evidently impossible for a committee of this Association to undertake to gather statistics from the whole of the United States in regard to diseases of animals. It is some-

thing which even the general government has not been able to undertake, and the treasury of the United States is greater than the treasury of this Association so far. I think it would be unwise to furnish money to this committee to go into that line of work. It is too difficult to get the co-operation of a sufficient number of gentlemen over the country to make the statistical report of any value. I think the suggestion that has been that an investigation of one or two diseases be made by the committee is wise. The committee hereafter should endeavor to confine itself and its work to that line. The chairman of the committee for the past year should not be criticised, as he has followed the precedents established by the former committees. But these reports have been for the most part failures on account of attempting to do something which is clearly impossible, and it is to be hoped that the committee will bear in mind the wish of the Association which was expressed last year at Nashville, which it has again expressed at this meeting, that it confine its work to a line which is within its powers, and investigate one or two diseases in a way that will enable it to bring in some information of value to the Association and compensate us for the time which may give to the hearing of the report.

DR. PEARSON : The chairman of the Committee on Diseases last year made a suggestion similar to that by Dr. Cary, and following that suggestion, the Committee on Resolutions presented this which was passed :

"Be it Resolved, That the Committee on Diseases is hereby instructed to devote special attention to the subject of osteoporosis and rabies, especially to the distribution, prevalence and losses caused by these diseases, and report upon the same at the next annual meeting." That resolution is in the proceedings of the 1897 meeting. I fear that it was overlooked. However, the matter has received a good deal of attention now, and it will probably be considered by the next committee, making that sure. I would move you that the resolution in reference to the Committee on Diseases that was passed at the last meeting be continued and apply to the committee that is to operate for the coming year. Seconded.

PRESIDENT SALMON : The motion before the Association is that the resolution of last year and the instructions of the last convention to this committee be continued for the year to come ; that is that the committee be instructed to devote its attention to the two diseases, osteoporosis and rabies.

DR. LAW : I would like to make this suggestion. I do not know that it is of very great importance, but it occurs to me that if we confine the attention of our committee to two specific diseases, that we may seriously hamper them in bringing in a report that will be worth the time. It is just possible that during the coming year there may be some disease that will become very prevalent, and that it would be very important to our Association that this committee be allowed to report upon, and not be debarred from having anything to do with it. I would prefer the suggestion of Dr. Clement,—I do not think it was put in the form of a motion,—and that is, that the disease be not specified. You see these two diseases debar any other diseases.

DR. CLEMENT : I see that it does not prohibit them from investigating other diseases, still it devolves upon them to give special attention to those two diseases. It seems to me that it would be better to make the resolution in this way : That the Committee on Diseases are hereby instructed to devote special attention to one or two diseases, and to report upon the same at the next annual meeting.

DR. PEARSON : I must adhere to my original motion because these two diseases, osteoporosis and rabies are the two diseases which this Association desires special information upon, and if we desire special information upon these two diseases, I think we have a right to ask our committee to obtain it for us. This resolution does not prevent this committee from considering other diseases. It merely asks them to devote special attention to these two. I think that the resolution is desirable in its present form.

DR. HOSKINS : I hope the original motion will prevail, and that the committee will be instructed to take up the diseases of osteoporosis and rabies. They are now of great importance to us in the east, and must be to those in the west where we buy our supply of horses. There seems to be no reliable statistics or information upon them, yet we can have reports from various points of cases that were taken up, thoroughly studied and investigated.

The motion of Dr. Pearson prevailed.

DR. PETERS : Mr. President, I move that in the chairman's report of the Committee on Diseases, all be stricken out except the report on osteoporosis and rabies. Seconded and carried.

The Executive Committee submitted the following report :

REPORT OF THE EXECUTIVE COMMITTEE.

MILLARD HOTEL, 7:30 P. M., SEPTEMBER 6, 1898.

On call of the chairman the Executive Committee was convened with the following members present : Drs. Baker, Cary, Clement, Hoskins, Lowe, Reynolds, Salmon, Stalker, Stewart and Williams.

Absent : Drs. Peters, Rayan, and Raynor.

The committee appointed by the Executive Committee at the Nashville meeting in the case of James B. Raynor reported as follows :

The special committee appointed to consider and report upon the complaint of Dr. J. B. Raynor, to the effect that an injustice had been done him by the publication of a letter in the American Veterinary Review of August, 1887, containing a quotation from the same journal of January, 1877, in which it was stated that he had been connected with a veterinary college that had disposed of diplomas illegally, have investigated the complaint and beg to report as follows :

We find that Dr. J. B. Raynor was not connected with the institution at the time of the illegal transactions reported in the article in question.

ROSCOE R BELL,
LEONARD PEARSON,
W. L. WILLIAMS,
Committee.

Moved by Dr. Stewart and seconded by Dr. Clement that the report of the committee be accepted and adopted. The motion prevailed.

The Secretary presented the following applications for membership : James Bullivant (V.S., Ont. V. C., 1889), Spokane, Washington, voucher, S. B. Nelson ; E. M. Nighbert (V.S., Ont. V. C., 1894), Mt. Sterling, Illinois, vouchers, R. R. Bell and W. Herbert Lowe, which were duly considered, and a motion prevailed to favorably recommend their election to membership.

The application of Geo. W. Dunphy for reinstatement was next presented, with the announcement that he had paid dues in full to date of suspension, and a motion prevailed to favorably recommend his reinstatement.

It was moved by Dr. Williams and seconded by Dr. Clement, to receive and accept the report of the Secretary on delinquents, and recommend that they stand suspended, this action to take effect at the close of this meeting unless their delinquency be satisfied :

On motion the committee adjourned to meet on call of the chairman.

S. STEWART,
Secretary.

On motion of Dr. Hoskins, seconded by Dr. Baker the report was received.

Dr. Hoskins moved that that portion of the report of the Executive Committee in regard to Dr. Raynor be approved, which motion was duly seconded.

The next matter covered by the report of the Executive Committee, was the question of delinquents. Dr. Clement moved to adopt the recommendation of the Executive Committee. Seconded by Dr. Peters. Carried.

Upon the question of the adoption of the report of the Executive Committee as a whole, Dr. Hoskins moved, seconded by Dr. Williams, that the report be adopted as read. Carried.

Dr. Stewart moved, seconded by Dr. Williams, that we suspend the rules, and the Secretary be authorized to cast the ballot of the Association for Drs. Bullivant and Nighbert for membership. Carried. The ballot was so cast and the candidates declared elected to membership by the chair.

Dr. Hoskins moved that Dr. Dunphy be reinstated, seconded by Dr. Peters, and carried.

THE CHAIR : I will now call for the report of the Committee on Incorporation, Dr. Hoskins, chairman.

Dr. Hoskins as chairman of the Committee on Incorporation made the following report : At our meeting yesterday the Committee on Incorporation went over the situation of affairs, and we found that the act of incorporation granted to the National Veterinary Association of this country, was granted under a law providing for the incorporation of such bodies in the District of Columbia, and that such an act of incorporation can be obtained to-day at a very slight cost. It is not such an act of incorporation though, as I think the Association had in their mind, and had hoped to obtain at the hands of Congress. Our object was to obtain an act through Congress granting us the right of incor-

poration by which we could use a common seal, and the members to be protected in the use thereof. The act of incorporation that we would obtain through the present law governing such matters in the district of Columbia, does not seem to me to be of any great value to us; therefore, I would like to have an expression of opinion from the Association as to whether it would be worth our while to obtain such incorporation. It is simply an act of incorporation by which any society may be incorporated.

A MEMBER: I would like to ask the chairman of the committee whether that would be any better than an incorporation or charter from a State—any state—for instance New York State or Pennsylvania?

DR. HOSKINS: Personally I don't think it would.

DR. CLEMENT: Mr. President I don't think we want any act of incorporation.

DR. HOSKINS: It might be well Mr. Chairman to decide whether you will continue this committee. The question of changing the name is still in the hands of the executive committee and they are not ready to make any report until they are informed just what this charter of the National Association represents.

DR. COTTON: As president of the defunct National society to whom this charter belongs, I wish to say a few words. I was notified a few days ago, at least at our last meeting, that something was to be done in regard to changing the name and if possible using the charter. We have the one granted by Congress, the only one that Congress will grant as I am informed. It is simply on file, in the records of the Register of Deeds office at Washington, D. C. I could not say whether it could be changed. As far as I am concerned I am willing to make any change for the benefit of the present association.

DR. HOSKINS: Do you understand that this charter for the National Association was issued by a special act of Congress?

DR. ROBINSON: No sir. The charter existing is simply a deed of incorporation filed with the Recorder of Deeds of the District of Columbia, under a law for establishment of institutions of learning, secret societies, and other learned bodies; each of the different bodies have a peculiar law laid down by Congress for their formation. The present corporation, as the National Veterinary Association can sue and be sued, it is a legally incorporated body to do business, whereas the United States Veterinary Medical Association to-day is not, inasmuch as it has no

recognized formation under the law. A similar charter can be taken out without any special cost, under any name so long as it does not conflict with that name, or the name of any society already organized.

THE PRESIDENT : The Chair would state for the information of the members that the reason we have been considering and investigating this charter is that we were laboring under misapprehension as to the nature of the charter. We supposed that it had been issued by a special act of Congress and was a national charter, but it appears now from the information we have received from those who know about it, that it is simply such a charter as any one would get by complying with the law relating to incorporations of the District of Columbia, and Congress in passing this law under which this incorporation was made was simply legislating for the District of Columbia the same as state legislatures pass laws for the states by which incorporation can be made, and if we took it out under that law it would be the same as if we took it out under any state law. There would be no advantage in taking it out under the law of the District of Columbia. It would be the same as if we took it out in any state. It was desirable to ascertain the facts in connection with the issuance of the charter in considering the change of name, which is an important question to be decided at this meeting.

DR. WILLIAMS : I move that the report of the Committee on Incorporation be accepted and the committee discharged. Seconded and carried.

The chair then called for the report of the Finance Committee, and Dr. Lowe asked for further time which was granted.

The Chair then called for the report of the Secretary, which was read by Secretary Stewart as follows :

SECRETARY'S REPORT.

Mr. President and Members : The Secretary's office has been one of continuous activity from the close of the meeting at Nashville to the opening of this meeting in Omaha. Nothing has been postponed nor left undone that would enhance the interests of the Association or tend to make this gathering of veterinarians from all parts of our country one of great value to the members personally and to the profession in general.

The resident state secretaries have taken a more active inter-

est generally than heretofore for which they have my hearty thanks and should receive the Association's commendation. Through their co-operation two circular letters also application blanks and copies of Constitution and By-Laws have been placed in the hands of veterinarians in all the states and territories and it is fair to presume the character of the Association and the grand work it is doing is clearly impressed upon the profession of this nation. It is gratifying to note that applications for membership come from all parts of the country which indicates its influence is national rather than local.

Members have been advised of matters pertaining to the Association and their personal relation thereto through numerous personal and circular letters, statements, etc. The personal letters occupy nearly 1,000 copy book pages.

Official notice of appointment was promptly given to members of committees and resident secretaries. Certificates of membership were issued to members elect and all communications from members have been given immediate and courteous attention.

In compliance with the Associations' instruction all accounts for delinquent dues which had been placed in the hands of the American Publishers' Collection Co., under direction of the Association at a previous meeting, were promptly withdrawn from such agency, and each delinquent whose account had been so placed was duly notified of withdrawal, and requested to inform me if he had paid any money to the Collection Company, in which case his account would be duly credited to the amount paid.

All were duly notified that they were eligible for reinstatement upon payment of delinquent dues to date of suspension.

By direction of the President 200 blank certificates have been ordered. A few only were printed to fill an immediate need, and the stone set aside to await the action of the Association on proposed amendment, to change the name of the Association before the remainder should be printed and delivered.

The collections for the current year have been as follows :

Dues collected during the period ending Sept. 5, 1898..	\$890 20
Collected from suspended members	12 20
Received from American Publishers Collection Co.....	21 25
25 dues collected in advance for the year beginning	
Sept. 6, 1898.....	125 00
Initiation fees deposited.....	240 00
Sale of Reports of Proceedings.....	5 80
Sale of copy of Stenographer's report of Nashville	
meeting.....	25 60

DISBURSEMENTS FOR THE YEAR ENDING SEPT. 5, 1898.

Postage.....	\$ 90 27
Printing.....	83 60
Stenographer for Nashville meeting.....	174 35
Printing Reports of Proceedings.....	309 79
Engrossing certificates and resolutions.....	7 80
Bill of Com. on Army Legislation and other committees.....	—
Resident Secretaries' bills for postage and stationery..	36 54
Secretary's salary for 1897-98.....	200 00
Miscellaneous.....	16 30

STANDING OF MEMBERS RELATIVE TO DUES.

25 Members have paid dues in advance for 1898-99....	\$ ———
89 Members have paid dues in full to Sept. 5th, 1898 ..	———
80 Members who owe less than two years dues.....	400 00
62 Members who owe just two years dues.....	620 00
67 Members who owe more than two years dues.....	976 00

The collections for the year exceed the expenses and our cash balance remains sufficiently large to justify the reduction of annual dues which was so strongly urged last year.

The prospective reduction has inclined many to maintain their membership and induced others to apply who would have done otherwise had there been no reasonable probability of such change.

The large number of applications filed prior to the time of meeting should be very gratifying and looked upon as an indication of a revival of professional interest and undoubted improvement in veterinary practice generally. It is hoped that the papers, discussions and clinical demonstrations arranged for this meeting will give substantial assistance in the upward trend of the scientific and business aspects of veterinary activity in this country.

The Review and Journal should receive hearty commendation for the prominence given in their columns to the progress made from month to month in preparation for this meeting and their editorial encouragement.

All officers and committees have conspired with the members and press to make this meeting of tangible and undoubted value to all and we believe it will be apparent that success has crowned their efforts.

Respectfully submitted,

S. STEWART,

Secretary.

On motion of Dr. Nelson the report was accepted.

The next order of business was Reports of Resident State Secretaries.

The Chair stated that it was the custom to read them by the title and then refer them to the Publication Committee.

The Secretary then announced that he had on file five Resident Secretaries' reports, to-wit : Alabama, California, Connecticut, District of Columbia, Manitoba, and South Carolina.

STATE SECRETARIES' REPORTS.

ALABAMA.

Mr. President : The Montgomery city ordinances that regulate and control the inspection of meat, dairy and milk in that city have been tested in all points by cases that have been carried up to the state supreme court. It was most gratifying to have the supreme court sustain the laws of the city, in all of the contested points.

It may be of interest to know that the meat and milk inspectors of Montgomery, Alabama, will be required hereafter to pass a competitive examination before they can be appointed.

Mobile and Birmingham are contemplating the adoption of meat and milk inspection laws in the near future.

The following diseases have appeared in Alabama during the past year :

Glanders, hog-cholera, Texas fever, strangles, influenza, malignant catarrh. Infectious keratitis in cattle extended over the entire state during the past spring and summer. In most cases it left an opaque spot where the ulcer was located in the cornea. Rabies and osteoporosis have been more common than usual. Sore-head or a form of chicken diptheria has been very prevalent during the summer.

Respectfully submitted,

C. A. CARY,

Resident State Secretary for Alabama.

CALIFORNIA.

OAKLAND, CALIFORNIA, AUGUST 23, 1898.

Mr. President : I have the pleasure of submitting the following report as Resident State Secretary of California :

California with all her fine horses and countless herds of sheep and cattle, is almost entirely destitute of any laws governing and controlling the outbreak and spread of contagious diseases. There is no Board, or Commission, or even a State Veterinarian to whom the stock raiser can look for relief.

At the present time the state of California is experiencing a dry season, and the result is that the ranges are not furnishing nearly enough food for all of her animals, yet we are unable to move our stock to other states where feed is abundant, for the reason that we have had outbreaks from time to time of Texas fever and anthrax, and are simply placed under quarantine by the federal government. Other states can ship into our state anything they wish to, and there is no one to say nay, but we are unable to ship a hoof across the borders because there is no one who has authority to say that they are healthy stock or that they came from a non-infected region. At the next session of the Legislature we shall make a strong effort toward correcting this deplorable condition of affairs.

During the past year we have done something toward stamping out tuberculosis in our dairy cows. Some counties have appointed veterinarians and authorized them to apply the tuberculin test, and in a few counties a considerable progress has been made. At the present time all inspection along those lines seems to be at a standstill, presumably due to the fact that there are no general laws regulating and authorizing the inspection of dairy cattle for tuberculosis.

Our State Association is in a very flourishing condition, Dr. R. A. Archibald of Oakland being President and Dr. D. F. Fox of Sacramento, Secretary.

Respectfully submitted,

FRED E. PIERCE, D.V.S.,

Resident State Secretary of California.

CANADA.

Mr. President : The law in reference to contagious and infectious diseases in this province, as well as the entire dominion, works remarkably well. Inspectors are appointed by the government, unfortunately very often upon their political qualification

without respect to their fitness from a professional standpoint. The act is strict and heavy penalties imposed for infraction. The Inspector, with the consent of the owner, can destroy ; if objections are raised he quarantines the diseased and exposed animals until recovery, or the owner becomes convinced as to the existence of the disease. It is optional with the municipality whether or not they indemnify the owner of the destroyed animal.

The act respecting the veterinary profession is, I think, the only perfect one in existence on any statute book. They must be graduates of a three year college, pass the required examinations of the Provincial Board of Examiners, become a member of the Veterinary Association, and keep all calls paid up, and if they fail they then become unqualified practitioners, and subject to the same penalties as though they never graduated.

I am pleased to report the general health of the stock in the dominion has been good and remarkably free from contagious and infectious disease. A few cases of sheep scab have been detected in the extreme east and west. In one or two counties hog cholera continues at intervals to appear, but is rapidly disappearing.

The government, and with a few exceptions of the municipalities, entirely neglect tuberculosis, but I am pleased to report that as far as tests have been made the percentage, especially in the west where the air is pure, the range large, and the animals are not confined as in the east, is small. The only exception is in the old, improperly built and badly kept dairy stables, and I regret to again say that laymen and inexperienced and out of date veterinary inspectors are often appointed to fill these important positions.

There have been several cases of glanders, especially in the west. Those destroyed in this province can be traced to the "Broncho" from northern states and territories, being brought in without inspection. I am pleased at the better feeling which exists between your country and my own, and as an instance I would state that over 36,000 head of stockers were imported into your country from the north last year. You had the corn and we had the cattle, and were both benefited by the removal of the former restrictions.

The usual number of malarial diseases and influenza exist.

Our profession has no cause to complain ; they have been honored politically, they rank as officers in the army, are members of "the staff ;" the Association regulates the charges, we are

exempt from jury duties, and receive professional pay while attending court, etc.

Respectfully submitted,

W. P. HINMAN,

Secretary for Canada,

Winnipeg, Manitoba.

CONNECTICUT.

Mr. President : I have the honor to submit the following report in behalf of the Veterinary profession of the state of Connecticut :

Laws regulating the control of contagious diseases remain as reported last year. The tuberculosis laws then newly enacted have now been in operation a year, resulting in a physical examination of many herds of cattle and only a very few cases reported condemned.

Veterinary Association affairs have been quiet again this year, we have accomplished nothing since the defeat of our last attempt at legislative recognition. Interest in the Association seems difficult to revive. I have made two unsuccessful attempts within the year to awaken the enthusiasm formerly manifest.

Contagious diseases have not been reported as being extensive during the year. Glanders reported to a varying degree in different parts of the state, but the total number of cases reported being few. Hog cholera continues prevalent, at times inflicting heavy losses on the local swine industry. Influenza was exceedingly prevalent in the early spring. Rabies reported in several parts of the state but no reports verified ; I have been unable to find any cases here.

Of the more progressive sanitary measures more especially affecting the Veterinarian during recent months was the formation of the Medical Milk Commission of Hartford county, appointed and developed by the physicians of the Hartford County Medical Society. This commission was organized for the purpose of obtaining a pure certified milk supply to be used more especially by invalids and infants.

The milk commission has organized and started two places for producing the milk which is sold as "Commission Milk." The places selected were thought to be more especially adapted for the purposes required ; a chemist, bacteriologist and a veterinarian were selected to make the necessary monthly inspections of

the milk, dairy and the general health and surroundings of the herds.

The milk has been offered to the consumers since March and the results have thus far been pronounced very satisfactory by both public and physicians. The dairies include one herd containing thoroughbred Ayrshires and the other thoroughbred Jerseys. In making the veterinary inspection special attention is given to the sanitary conditions of both stables and dairies, health of the animals, the feeding, watering and periods of lactation. Animals before being entered into Commission work are required to pass a satisfactory physical and tuberculin examination.

Respectfully,

RICHARD P. LYMAN, M.D.V.,

Resident State Secretary of Connecticut.

DISTRICT OF COLUMBIA.

Since the eradication of contagious pleuro-pneumonia, the most serious disease that has prevailed in the District is rabies. Its presence in the city of Washington was recognized in the spring of 1893. During that year eleven animals were demonstrated to be rabid. In the fall of 1895 a fatal case of rabies in a lady occurred which directed general attention to the subject, and arrangements were made with the health officer of the District to send all dogs or other animals suspected of having the disease to the laboratory of the Bureau of Animal Industry for the purpose of making a positive diagnosis. Between September 27, 1895, and August 1, 1896, a few days over ten months, 15 suspected dogs and two foxes were received. The foxes and 80 per cent. of the dogs were found by the inoculation test to have had rabies. Since then the diagnosis of rabies in five cases has been confirmed by experimental inoculations. Several persons have been bitten by rabid dogs. One case, besides that referred to above, resulted fatally while others have been sent to Pasteur hospitals in Baltimore or New York City for treatment, and did not succumb to this terrible malady. The number of cases of glanders has been much less during the past year than formerly, due to the better enforcement of the law in the adjoining states of Maryland and Virginia. This disease was in past times prevalent in the stables of some of the street-car lines when horses were used, and many

of the owners were averse to killing their horses when they could be disposed of to unsuspecting purchasers. At the present time the street-car lines generally are operated by electricity or cable, and this means of keeping up the disease is no longer to be feared.

Tuberculosis prevails to some extent in dairy herds, though the health of cattle in these herds is generally good. At the last session of Congress provision was made for an additional inspector attached to the municipal government. All official work connected with the fire department and District Board of Health was until recently under the supervision of one veterinarian. As the duties of this office were too great to be successfully performed by one man, provision was made for two veterinarians—one to superintend the buying and treatment of the horses belonging to the District, and the other to give his time exclusively to the supervision of the dairies. A system of permits has been established, requiring that all dairy farms supplying milk to the District of Columbia should obtain a permit from the health office. These permits can be revoked if the stables are not kept in a sanitary condition, or other regulations not complied with.

A. M. FARRINGTON,

Resident Secretary.

PRESIDENT SALMON: Is there any new business to come before the Association at this time?

DR. LAW: I wish to make just one remark at this time. We had a most admirable paper on the subject of intelligence and education, but there was one remark with which I am somewhat inclined to differ. A reference was made to the experience of New York in the last year or two, having proved that the raising of the standard of entrance to colleges is unwise. With all my esteem for my friend to the right, I think he may be caught napping at some time, but I am confident of this, that but for the schools outside, and but for the fact that students were not prepared inside of the state to enter upon or take advantage of our New York state law, that we would have had a very different showing. We entered in 1896 upon the entrance requirements and a three year course. The demand was then made that a man should have had two years high school course, and those that wished to enter at that time were not prepared; they had to wait

and take the two years. And last year we entered upon the four years high school course. This was still harder. We could not be expected to draw students at once under those circumstances. This is the first year in which the students who began to prepare upon the passage of this law and the putting of it into effect could come forward and really put the matter to a test one way or the other. It is too soon to say yet whether this extra requirement for admission is going to reduce the number of students beyond what it ought to be, or increase the number, or to leave it at a reasonable rate. As I have shown in the Turf, Field and Farm, and also in the American Veterinary Review, we can secure a demand, as a mere matter of arithmetic,—a real demand for at least sixty men a year, and that would be a fair supply for two schools in the State of New York, for we can, as we will doubtless sooner or later, come to a four years' course, which would mean 240 students.

Now, another point is this: that the men who wanted to get into the profession readily, had to go out of the state if they wanted to get into it too soon, too rapidly and too easily, since the schools out of the state did not all come up to the standard of the requirements that the New York schools have adopted, or rather that the New York Legislature has adopted. Then it is unfair yet to say, above all at this early date, that the result in New York has proven the impropriety of this. If the schools outside of New York come up to our standard, a man would not have to go outside of the state. Is it not what is lacking in the requirements in the other states that has led, if anything has led, to the deficiency of students in the New York schools? I merely wish to point out that the time is not ripe yet to decide this question.

PRESIDENT SALMON: If there are no further remarks we will pass to the order of election of officers. The first thing in order is nominations for President.

Dr. Pearson placed in nomination Dr. A. W. Clement.

DR. PETERS: I move you that the first ballot be an informal ballot. Seconded.

DR. PEARSON: As an amendment to Dr. Peters' motion, I move you that no names that are voted for on this informal ballot shall be counted by the Secretary unless they have been put in nomination from the floor. Seconded and carried. Original motion as amended was then put and carried.

DR. PEARSON: I desire to formally nominate Dr. Clement.

DR. WILLIAMS : As no further nominations are offered I move you that nominations close. Seconded and carried.

DR. PEARSON : I move you that the motion of Dr. Peters that the first ballot be informal, be reconsidered, and that the Secretary be instructed to cast the ballot of the Association for Dr. Clement as President. Seconded and carried.

SECRETARY STEWART : Mr. President : I formally cast the ballot of this Association for Dr. A. W. Clement as President for the ensuing year.

PRESIDENT SALMON : The Chair takes pleasure in announcing that Dr. Clement is duly elected as President of this Association for the ensuing year. The next in order is the nomination of Vice-Presidents.

DR. BELL : I place Dr. Pearson, of Pennsylvania, in nomination for Vice-President for the East.

On motion, nominations for Vice-President for the East were closed.

DR. PETERS : For Vice-President for the Central West, I place in nomination Dr. A. H. Baker.

DR. KNOWLES : For Vice-President for the Central West I place in nomination Dr. John Mitchell.

On motion nominations for Vice-President for the Central West were closed.

DR. HOSKINS : For Vice-President for the West I place in nomination Dr. S. B. Nelson.

On motion nominations for Vice-President for the West were closed.

DR. WILLIAMS : As we have but one candidate for Vice-President for the East and for the West, I move you that the Secretary be instructed to cast the ballot of this Association for Drs. Pearson and Nelson, under suspension of the rules. Seconded and carried.

DR. STEWART : I officially cast the vote of this Association for Dr. Leonard Pearson for Eastern Vice-President, and for Dr. S. B. Nelson for Western Vice-President.

THE PRESIDENT : I declare these gentlemen duly elected. You will now prepare your ballots for Central Vice-President. I will appoint Drs. Lowe and Knowles as tellers.

The result of the ballot was as follows : Dr. Baker received 22 votes, Dr. Mitchell 18 votes, Blank one vote. Total, 41 votes.

THE PRESIDENT : Dr. Baker having received a majority of

the votes cast, I declare him elected Vice-President for the Central West.

Dr. Mitchell moved that the election of Dr. Baker be made unanimous. Seconded and carried.

PRESIDENT SALMON : Nominations for the office of Secretary are next in order.

A general call of "Stewart" was made all over the hall. Dr. Hinman moved that Dr. S. Stewart be elected Secretary by a rising vote. All the members present rose to their feet, and Dr. Stewart was declared elected Secretary for the ensuing year.

PRESIDENT SALMON : Nominations for Treasurer are next in order.

A general call for "Lowe," was heard over the hall. Dr. Hoskins moved that the rules be suspended and that the Secretary be instructed to cast the ballot of the Association for Dr. Lowe as Treasurer. Seconded and carried.

DR. STEWART : Officially I cast the ballot of the Association for Dr. William Herbert Lowe for Treasurer.

PRESIDENT SALMON : The Chair announces that Dr. Lowe is duly elected.

On motion, the convention adjourned until 1:30 P. M.

Afternoon Session.—The Association was called to order at 1:30 P. M. President Salmon in the chair.

The President announced new business as the first in order.

DR. HOSKINS : I present charges against Dr. C. J. Sihler of Kansas City ; the charges are violation of the Code of Ethics, and I herewith hand the secretary the evidence. The charges against C. J. Sihler are, using an illuminated circular, which was hung around the livery stables in Kansas City, Missouri, which I hold is in violation of the Code of Ethics of this Association. I also wish to prefer charges against Dr. Emele Poupport of Fort Collins, Colorado, for violation of the Code of Ethics in advertising a secret remedy for the cure of hog cholera. Referred to the Executive Committee.

Dr. Stewart moved that the President be authorized to expend Association funds to the extent of \$10.00, if necessary, to assist Local Committees in arranging an amphitheatre for the purpose of affording opportunity for all members to view the operations if we have Clinics at our future meetings. After con-

siderable discussion this motion was amended to make the amount \$20.00, which amendment was accepted, after being duly seconded.

DR. BELL : I move to amend the motion by making it a condition of such expenditure, that clinical demonstrators shall present papers on their operations previous to the demonstration, and thus facilitate their being understood. Seconded and carried.

The original motion as amended was put to vote and carried.

THE PRESIDENT : We will now proceed to the discussion of Meat Inspection. I call upon Dr. Hoskins to open the discussion. (See discussion on Meat Inspection.)

The Association adjourned at 4 P. M. in order that it might examine a collection of Pathological and Abnormal specimens obtained from food animals and used in illustration of the value of meat inspection. The specimens were collected by members of the Association in Omaha, Kansas City, and Sioux City and consisted of the following :

CATTLE.

<i>Disease or Condition.</i>	<i>Parts Exhibited.</i>
Actinomycosis.....	Head, tongue, lung, livers, glands.
Tuberculosis.....	Lungs, pleura, liver, lymph glands.
Texas Fever.....	Spleen, liver, skin showing ticks, and urine.
Disease of Liver.....	Fluke.
Bob-Veal.....	Carcass.

SWINE.

Cholera.....	Carcass, bowel, kidneys, lungs, and spleen.
Tuberculosis..	Lung, pleura, bone, lymph glands, tongue and heart.
Abscess.....	By kidney worms, carcass.
Disease of kidneys	Inflammation.
Disease of liver	Hob-nail, Echinoccus.
Pneumonia.....	Lung, liver, and heart.
Skin.....	Tinea, (ring worm, diamond).
Extra Uterine Pregnancy.....	Pig's head.
Foreign Body.....	Hog stomach (filled with nails).
Bladder.....	Inflammation.
Measles (cisticercus cellulosa)....	Liver, lung, heart and tenderloin.
Cirrhosis.....	Liver of distillery fed hog, one of 400, all more or less affected.

SHEEP.

Caseous disease.....	Carcass, lungs, heart, and liver.
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THIRD DAY—*Thursday, September 8th, 1898.*

Morning Session.—The Association was called to order by President Salmon at 10:30 o'clock.

PRESIDENT SALMON : It is with deep sorrow that we have learned of the deaths of our honored members, Drs. Thomas A. Giffin and D. P. Frame. I make this announcement to the Association and will refer the matter to the Committee on Resolutions with the request that it formulate and present to this Association before its adjournment suitable resolution in regard to those members so that the Secretary can have them properly engrossed. The first thing in order is the report of the Executive Committee.

DR. STEWART : The Executive Committee submits the following report :

MILLARD HOTEL, 9 A. M., SEPTEMBER 8, 1898.

The Executive Committee was convened at the call of the President, the following members present : Drs. Baker, Cary, Clements, Hoskins, Lowe, Salmon and Stewart. Absent, Drs. Peters, Rayen, Raynor, Reynolds, Stalker and Williams.

On motion the proposed amendment to the Constitution to change the name Association was taken up for consideration. After full discussion, it was moved by Dr. Clement and seconded by Dr. Lowe to favorably recommend that Article I of the Constitution be amended to read "The American Veterinary Medical Association," instead of "United States Veterinary Medical Association." The motion prevailed.

Following careful consideration, it was moved by Dr. Hoskins, and duly seconded and carried, to ask that unanimous consent be given to change the form of certificate by omitting the words "are to" after the word "presents" in the first line.

The Secretary presented the following applications : Edward C. Fox (D.V.S., A. V. C., 1889), 2823 Huntington Ave., Baltimore, Maryland, voucher, William Dougherty ; J. W. Griffith (V.S., Ont. V. C., 1892), Cedar Rapids, Iowa, vouchers, A. T. Peters, S. B. Nelson ; J. Otis Jacobs (D.V.S., Vet. Dept. Univ. Cal., 1898) Corner 26th and N Streets, South Omaha, Nebraska, voucher, Don C. Ayer ; Alexander Plummer (D.V.S., C. V. C., 1888), Walla Walla, Washington, voucher, S. B. Nelson.

After due investigation, it was moved and carried to favorably recommend their election.

The committee adjourned.

S. STEWART,
Secretary.

On motion the report was received.

The various recommendations of the committee were separately considered and adopted after which Dr. Cary moved that the report of the committee, as a whole, be adopted. Seconded and carried.

Dr. Reynolds moved that the rules be suspended and the secretary be instructed to cast the ballot of the Association for the persons named in the report of the committee. Seconded and carried.

The secretary cast the ballot of the Association for the persons mentioned, and the President declared them duly elected to membership in the Association.

SECRETARY STEWART: I have the following notices of changes in the Constitution and By-Laws. Notice of motion to change Article I of Chapter 6 of the By-Laws of the Association by inserting after the word "veterinarians" in the second line of page 9, the following: "except that graduates between the years of 1895 and 1897 from all colleges which are now up to the spirit of the law and which have organized a three years' course since the fall of 1897, shall be eligible to membership."

A. W. CLEMENT,
A. H. BAKER.

Under the rules the resolution and notice was referred to the Executive Committee.

Notice is given of motion to amend Chapter 6 of Article I of the By-Laws by adding thereto the following:

A graduate of an agricultural college requiring a four years' course may be admitted to the second year in any three year course veterinary college, provided said graduate has been required to take the following studies or their equivalent:

Two or more years in practical and theoretical chemistry; nine months in elementary physiology, in botany, in zoology (including animal parasites) and in agriculture (including breeds of stock and stock breeding) and one collegiate year in veterinary science under the supervision of a qualified veterinarian.

A. W. CLEMENT,
C. A. CARY.

PRESIDENT SALMON : There being no further business, we will pass to the reading of papers : The first paper in order is "Acute Indigestion in the Horse," by Roscoe R. Bell of New York. (See papers.)

Afternoon Session.—Dr. M. H. Reynolds, Minnesota, presented a paper upon "State Control of Hog Cholera." (See papers.)

The next paper in order was "Wild and Cattle Disease," by Dr. H. D. Fenimore of Tennessee, who was not present, the reading of the paper was by title only. (See papers.)

Dr. C. C. Lyford then discussed the subject of "Radical Operation for Contracted Hoof," and presented for inspection numerous photographs taken from patients, as well as various kinds of shoes used by him in his practice.

Dr. S. S. Whitbeck presented and read a very interesting paper on the subject of "Points of Value in a Country Practice." (See papers.)

Dr. John W. Connaway next presented and read a paper on the subject of "The Practicability of Immunizing Breed Cattle by the Tick Method." (See papers.)

Dr. Lowe, Treasurer, presented the following as his report, which on motion duly seconded was adopted :

TREASURER'S REPORT.

OMAHA, NEBRASKA, SEPTEMBER 5, 1898.

W. HERBERT LOWE, TREASURER, IN ACCOUNT WITH THE UNITED STATES VETERINARY MEDICAL ASSOCIATION.

RECEIPTS TO DATE.

1897.

Sept. 21.	By check from Secretary.....	\$500 00
Oct. 15.	By check from Secretary.....	332 22

DISBURSEMENTS TO DATE.

1897.

Sept. 21.	Paid Dr. D. E. Salmon appropriation to Pasteur monument fund.....	\$ 15 00
Oct. 7.	Paid Dr. S. Stewart re-imbursement of amount paid stenographer at Nashville.....	174 35
Nov. 29.	Paid the Lane Printing Co. for stationery.....	18 50
Nov. 29.	Paid the Press Printing & Pub. Co. for letter heads and envelopes for Treasurer.....	3 00

HELD AT OMAHA, NEBRASKA, SEPTEMBER, 1898 61

Nov. 29.	Paid Dr. W. L. Williams for stationery and postage as chairman of Committee on Pub.	4 55
Dec. 11.	Paid Lane Printing Co. for 500 copies 1897 Proceedings -----	309 79
1898.		
Jan. 18.	Paid Dr. W. Horace Hoskins for boxing 2 boxes books and cartage to freight depot -----	3 25
Jan. 18.	Paid Spaulding's Commercial College for lettering 24 certificates of membership -----	4 80
Feb. 28.	Paid Geo. E. Howard & Co. for stationery for President's use -----	3 00
May 14.	Paid the Lane Printing Co. for stationery and copies of By-Laws -----	30 05
	Balance in bank -----	265 73
		<hr/>
		\$ 832 22 \$ 832 22

I have the honor to submit the following supplementary report bringing the accounts down to September 8, 1898 :

Sept. 5.	Balance as per report -----	\$ 265 73
Sept. 8.	By credit given Secretary for bills paid by him -----	154 12
	By credit given Secretary for salary -----	200 00
	By cash from Secretary -----	783 00
	Secretary's salary -----	\$ 200 00
	Bills paid by Secretary -----	154 12
	Balance on hand -----	1,048 73
		<hr/>
		\$1,402 85 \$1,402 85

Respectfully submitted,

W. HERBERT LOWE,

Treasurer.

September 8, 1898. Examined and found correct.

M. STALKER,

A. W. CLEMENT,

S. STEWART,

Secretary.

PRESIDENT SALMON : Gentlemen, the presidential term for 1897 and 1898 has expired. As the incumbent of the chair it only remains for me to thank you for the kindness and forbearance you have shown ; I desire to thank the gentlemen who have worked on the various committees, and particularly the gentlemen on the local committee, and also our secretary, who has

given so much of his time, and through his efforts you are largely indebted for the success of this meeting. I now surrender the gavel to Dr. A. W. Clement as my successor, whom you have elected. (Applause.)

President-elect Clement on taking the chair extended his thanks for the cordial manner in which he had been elected to the presidency.

The committees for the ensuing year were announced by President Clement. See committees on page 8.

The Report of the Committee on Resolutions was presented by the Secretary as follows :

OBITUARY.

WHEREAS, Dr. Thomas Giffen, of New York City, an accomplished veterinarian and a member of this Association, has been removed from life during the past year ; be it

Resolved, That this meeting expresses its sense of the great loss to this Association and to the profession, and that we tender to the bereaved family the expression of our profound sympathy in their great affliction.

Resolved, That this resolution be spread upon the minutes of this Association, and a copy forwarded to his family.

WHEREAS, Dr. D. P. Frame, of Colorado, a young and valuable member of this Association, has been removed by death ; be it

Resolved, That this Association expresses its sorrow at the loss sustained by us, by the profession, and by the community in which he lived, and extends its profound sympathy to the bereaved family ; and be it further

Resolved, That these resolutions be spread upon the minutes of this Association and a copy forwarded to the family.

MILK INSPECTION.

WHEREAS, Many of our states and municipalities have not yet adopted any law looking toward the inspection of dairies ; be it

Resolved, That a system of thorough inspection of dairies as to their sanitary condition and surroundings be recommended, and that a system of the testing of cattle for tuberculosis be advised.

MEAT INSPECTION.

WHEREAS, In the matter of municipal meat inspection such a system as would be of any benefit to the public is not possible under the existing arrangement of many small slaughter houses ; be it

Resolved, That this Association recommends the establishment of one or two abattoirs in each city as indispensable to the rational pursuance of such a system under properly qualified veterinarians.

THANKS.

WHEREAS, The thirty-fifth Annual Convention of the United States Veterinary Medical Association is now closing its labors in the City of Omaha, where it has been so well entertained by the local committee, be it

Resolved, That the thanks of this Association be heartily given to this committee for the very agreeable manner in which they have performed their duties.

WHEREAS, This Association is under great obligations to the Cudahy Packing Company for the provision of a room for the exhibition of specimens in the meat inspection service ; be it

Resolved, That this Association extend its sincere thanks for the courtesy shown.

A. W. CLEMENT,
C. A. CARY,
S. STEWART,
Committee.

Resolved, That hereafter except by special action of the Executive Committee, papers to be presented to the Association shall not exceed four thousand (4,000) words to be *read*, and it is requested that the Publication Committee shall be supplied with a carefully typewritten and edited copy prior to presentation.

Reported favorably,

W. L. WILLIAMS.

A. W. CLEMENT,
C. A. CARY,
S. STEWART.

On motion the resolutions were adopted as read.

Gratification was generally expressed by the members present that so large a number of visiting ladies had been present at the meetings—the largest attendance of ladies in the history of the Association—and that the local committee, through their tireless energy, had provided highly agreeable entertainment for them during the entire period of the convention.

CLINICS.

During the morning hours of the several days of the meeting prior to convening, the members were invited to attend clinical demonstrations arranged through the courtesy of the local committee at a convenient point.

Judged as the initial attempt at clinical demonstrations by the Association it was considered highly successful and the attendance at these was constantly large and deep interest was manifested in each operation. The list of operations and operators was as follows :

Castration of Cryptorchid Horse, by Dr. C. E. Cosford, South Omaha, Nebraska ; Castration of a Ridgling Horse, by Dr. Geo. A. Scott, Independence, Iowa ; Arytenoideraphy, by Dr. L. A. Merillat, Chicago, Illinois ; Vaginal Ovariectomy in a Mare, by Dr. W. L. Williams, Ithaca, New York ; Ovariectomy in a Bitch, by Dr. James Vincent, Shenandoah, Iowa ; Radical Operation for Contracted Hoof, by Dr. C. C. Lyford, Minneapolis, Minnesota.

SECRETARY STEWART : The receipt of five letters from the various officers, including the Governor of the State of Michigan, the Mayor of the City of Detroit and secretaries of various civic bodies, inviting the Association to come to Detroit next year to hold its meeting. Referred to Executive Committee.

On motion the Association adjourned *sine die*.

DISCUSSION OF MEAT INSPECTION.

METHODS OF CULTIVATING PUBLIC OPINION AS TO THE NECESSITY OF MUNICIPAL MEAT INSPECTION.

BY W. HORACE HOSKINS, PHILADELPHIA, PA.

Mr. President and Gentlemen : The question which I am asked to consider with regard to the subject of meat inspection, is one that touches keenly every member of this organization. It is a subject that has gone through a series of experiences during the last eight or ten years and has taught us most thoroughly and many times painfully the necessity of a more conservative method of arousing public opinion as to the need and necessity of meat inspection. And this calls first on our part for conservative expressions in public audiences, in public journals, in the newspaper press, and before public bodies, and in the daily walks of life. I think that there are none who have done the subject of meat inspection more harm than the veterinarians themselves, and it has been the result of exaggerated expressions, thoughtless remarks, and of the failure to impress those with whom they come in contact of the full and real importance of this work. There has been too wide a divergence of opinion as to how far and how complete the subject of meat inspection should be carried. We should have been satisfied with an entering wedge in this direction, no matter how little it attained the ultimate end, and how little it appeared to reach our ideal of what was necessary in this direction. Had we taken this view of the necessity of meat inspection, and worked upon this line, I think there would have been at this time thousands of veterinarians in public employ throughout our nation. Employed by the United States government, employed by the state, and by the cities and towns. We have not used those who have already gained these positions in small towns throughout the country as we should have done. We might to-day take this list of men and show the work they have been doing, and publish it in some simple way in pamphlet form for general dis-

tribution over the country. This is a work that might be well done by this Association.

The use of public meetings is of the greatest importance, and when those are held in one's community he should thoroughly prepare himself to discuss this subject in a conservative and intelligent manner, and be prepared to show what has already been accomplished, and its great need. Farmers' institutes can be utilized in the same direction, and here is a great field for our work. This class of men are largely arrayed against meat inspection, and are arrayed against it because of their ignorance of its true meaning and purpose, and because they are ignorant of the great benefits which must largely accrue to them from a proper and judicious line of work in this direction. Our Boards of Health are ignorant apparently of this great need. And I have no doubt that there is not here—of the members here present, and of the members of our organization, there is perhaps not one-fifth of them who have ever brought this matter to the attention of their local Boards of Health, and therefore are largely responsible for the lack of appointment, recognition and support from this direction. We have all advocated and talked of the need of a veterinarian on every Board of Health. How many of us have made any effort to make this a surety? You should not wait to be asked. Take this thought home with you and commence at once upon your state or municipal Board of Health.

Sanitary organizations, and sanitary conventions are continually meeting in the various cities of the United States, and how rarely do we find a veterinarian's name on the programme, to consider any of the subjects he is so directly interested in and of which he is best able to give the proper line of thought to those who are considering sanitary questions. We had yesterday an exhibition of specimens that were to us as veterinarians of peculiar interests, and how much more impressive this would have been could they have been exhibited to a large body of intelligent laymen. To see that remarkable collection and to see the conditions that our United States government inspectors are constantly dealing with in the interest of health of foreign countries was one of the most impressive thoughts that came to my mind, and to think of the possible danger that the subjects from which those were taken were liable to be put upon our home market, because they could not be sold in foreign countries, and this possible simply because of the lack of local inspection. This

might be well done by our state and by our local associations, and I take home the thought from here that it will be one of the means by which we will be able to arouse a greater interest in Pennsylvania and in our own city for a common movement of this kind.

Another method, you have in your cities and towns health associations, protective associations, city associations, all of them interested in the general advancement and welfare of the people, whose members might be taken to the different places of slaughtering and actually shown this condition of things. We have used this method in the city of Philadelphia of taking around members of these organizations, and showing them the condition of the small abattoirs that are so numerous on the outskirts of the city, and thereby we have awakened a sentiment there to-day that offers an opportunity for more complete inspection of meats in Philadelphia, and that method could be used in hundreds of other places throughout the land. It is your duty to take up this matter. It is your duty to go home and take up work of this kind. The little journal or the daily press—the newspaper of your own community can be used in conservative expression at all times, and you could do nothing better in my mind than to study a recent report of the Department of Agriculture showing the work that has been done by the Bureau of Animal Industry, and thus teach your people that which they do not know, and arouse a sentiment among them that will ultimately cause a sanitary police system to be established in this country, and then the cry that has been heard among veterinarians for the last ten or fifteen years for employment will not be heard again in this country.

PRESIDENT SALMON : The chair feels it incumbent upon him to explain a sentence which was used by Dr. Hoskins, which gives the impression that the federal government meat inspection was designed for the protection of foreigners instead of our own citizens. There are many who have that opinion and frequently express it. I do not think Dr. Hoskins intended to give that impression, although his words do so. The meat inspection protects the people of foreign countries and people in other states of this country to which the meat is shipped. Of course the federal government cannot go into any of the states and inspect meats secured from cattle killed in that state and being intended for consumption within that state. It has no jurisdiction in a case of that kind, but it has jurisdiction, and the federal law covers

the inspection of meat, the production of animals killed in one state and intended for consumption in another state, and this covers a great majority of the meat consumed in the country. Yet it is lacking for meat intended for local consumption, and it is possible to kill the diseased animals and put them on the market for local consumption. And it may be claimed that they are to be put on the market for local consumption and yet it probably would not be very difficult to get it out to other places. So there is need of municipal inspection.

THE NECESSITY FOR CONSOLIDATION OF SLAUGHTER HOUSES
INTO LARGE ABATTOIRS UNDER MUNICIPAL CONTROL AND
DISPOSITION OF THE FLESH OF TUBERCULOUS CATTLE.

BY DR. LEONARD PEARSON, PHILADELPHIA, PA.

In regard to the necessity for consolidation of slaughter houses into large abattoirs under municipal control, it seems to me it is scarcely necessary to submit an argument for this purpose. I say it is quite important for meat inspection, because in general it is not possible to inspect meat without such a concentration in most of the large cities. I may be somewhat at fault, however, in making that too general. I will say in most of the large eastern cities where slaughtering has been conducted for a very long time, a system of private slaughter houses has developed that make it practically impossible to inspect meat. In Philadelphia there are more than two hundred private slaughter houses ; there are a great many in New York ; a great many in Baltimore and so on. Boston, however, has consolidated its slaughtering business into the Brighton abattoir, and their system is without this very serious objection.

When meat inspection is proposed the very first question that comes up in the minds of practical men is, how expensive will this be? Will it not tend to increase the cost of meat, and will it not keep the poor people from buying as much meat as they would otherwise buy, and thereby work a hardship? If the inspection was made in the numerous small slaughter houses that are scattered throughout such a city as Philadelphia, the answer would be, yes, because it would require almost as many inspectors as there are slaughter houses, and where there are over 200 slaugh-

ter houses, you would see what that would amount to, and if the cost were put upon the cost of the meat it would certainly increase the cost of the meat, but if it were conducted by the municipality in one large abattoir, the cost for inspection would not be so great and hence the cost of the meat would not be materially increased. So the first step to bring about meat inspection is to bring the business together ; to establish a large abattoir, or slaughter house, where all the animals can be killed and where inspection can be carried out economically. Of course in addition to the facilities for inspection there are numerous other advantages in such a method.

It has been found in Germany where this system has been practiced for a great many years that meat is actually cheaper, that is, relatively it is cheaper now than it was when it was killed in small slaughter houses. Perhaps I should say the cost of killing—the cost of preparing the meat is less now than the business is concentrated than it was when it was prepared in the small slaughter houses. And this of course is explained by the economy that is effected by co-operation. The tendency of the times seems to be towards consolidation and towards unification of the large business enterprises. We see how the department stores are increasing in popularity in all of the large cities, and we see how trusts and combinations of business are developing, and this tendency is all due to the fact that a large business can be run more economically than a great many small businesses. It would be very much cheaper for the butchers in Philadelphia to co-operate and build one large slaughter house than to run two hundred small slaughter houses all over the city. And this has been demonstrated very clearly in the combined experience in Germany.

In Germany the slaughter houses belong to the municipality. Money is borrowed with which to build them, bonds are issued ; the money is borrowed on the bonds, the bonds are sold, and then a rental is charged the butchers for the use of the slaughter house. This rental is used for the maintenance of the slaughter house, for the payment of the inspectors, for the payment of the interest on the bonds. A part of the money also goes into the sinking fund that is created for the liquidation of the bonds as they come due. So that the whole cost of inspection there is placed upon the butcher and even under these conditions it is shown that the cost of preparing the meat is less than when slaughter houses were numerous and scattered.

Now as to the other point in reference to the disposition of the flesh of tuberculous animals. I think the first point to be considered is the question as to whether tuberculosis in cattle is transmissible to human beings? This question, however, is outside of my province and I therefore shall not report upon it, but I would like to call attention to the fact that there has been some misunderstanding of a recent article that has been published that bears indirectly upon this question. I refer to the report of Dr. Theobald Smith on the work that he did in inoculating calves with the tubercule bacilli from a human being. In the report of the Massachusetts Cattle Commission Dr. Smith reports some of the results through inoculation of calves with human bacilli. It is found that the disease developed very slowly and it is drawn from that that calves did not seem to be susceptible to tuberculosis from the human. Other communications have been issued upon the same point and there is at present a very general misunderstanding, or a misconstruction of this work, and many of the agricultural papers, and many of the newspapers may have used these experiments in a way that I do not think Dr. Smith or any one else who has done such work intended, and have stated clearly, or have intimated that the two diseases, human tuberculosis and bovine tuberculosis are different and distinct, and that the human disease cannot be transferred to cattle, and therefore the disease of cattle cannot be transferred to human beings. That is the unfair and unfounded deduction that has drawn from some of this work.

This matter was gone into very clearly yesterday by the president in his address, and I think we should all hesitate to form definite opinions upon these points until further experimental work is done. I might, however, state that during the past summer at the University of Pennsylvania calves have been inoculated with the sputum of human beings and they contracted the diseases quickly and every one of them died. Cruikshank of England, has also done work of this kind and it has given the same result. Of course I should have given his work first because it was done some years ago.

"It has a tendency to bring all the varieties together," a paper by Professor Nogard, and read at the recent national congress for the study of tuberculosis. Professor Nogard has made a study of the relation of human to avian tuberculosis and he has found that cultures of human tubercules can be transformed into cultures of avian tubercules. He has done this by making cellu-

loid capsules which have been filled with cultures of human tubercule bacilli. These have been introduced into the peritoneal cavities of fowls and been allowed to remain there six to eight months. The temperature of the fowls have served during this time to transform these cultures into the avian cultures, and moreover the germ itself grows just as the germ of avian tuberculosis grows, so that I think we are getting evidence constantly that tends to bring the varieties of tuberculosis together. And if this is true it makes the disposition of the flesh of tuberculous animals all the more important.

The disposition of the flesh of tuberculous animals has received a great deal of study, particularly of course where meat inspection has been practiced for a long time, and where this is one of the greatest economical questions of the day. In Saxony about 27 per cent. of the cattle killed in all slaughter houses are tuberculous. Now if more than one-fourth of all the animals killed in Saxony were thrown out, or destroyed outright, as the tendency was at one time, you could see what an awful blow it would be to the food supply and finances of the country, and if it were paid for by the public treasury, you again see what a drain would occur there.

Inoculation of animals with meat juice have shown that where tuberculosis is localized there is no general infection of the blood, there is no infection of the muscle juices in different parts of the body, and the meat, so far as inoculation of animals shows, is free from taint. These experiments have been conducted by a great number of persons from meat of animals suffering from all stages of tuberculosis, and at this time there is a general consensus of opinion in Germany as to what should be done with flesh of tuberculous animals. The plan there is to dispose of such meat in any one of four ways, depending upon the degree of development of the disease. In the first instance, if the animal is emaciated, or if the meat has an unhealthy appearance or if the tubercles are found in the muscles, it is destroyed outright. If, however, the disease is confined to one or two cavities and the animal is not emaciated, the diseased parts are destroyed, and in the large slaughter houses the meat is then cooked in a sterilized apparatus, thoroughly cooked, and then sold as cooked meat for a low price, and is bought up quite largely by the poor people. Thirdly, if the disease has only reached a less advanced development, the diseased parts are thrown away and the flesh is sold on what is known as the Fribald plan, that is to say, a special sale takes

place where the purchaser is told of the character and condition of the meat and is warned to cook it thoroughly. And thus it is that a great deal of meat that was formerly condemned can be sold safely in this way. Whether that would be possible in this country is another question.

Then fourthly, if the disease is confined to a single organ, or to a single group of organs, the diseased parts are thrown away and the flesh is allowed to go on to the market without any objections, just the same as pure meat and it is sold for full value. While the percentage of tuberculosis is so exceedingly high in many of the states of Germany, the percentage of complete condemnations of flesh is very low. In Saxony where I have stated that about 27 per cent. of all the cattle are tuberculous in some degree, only 8 per cent. of the tuberculous animals are destroyed and 92 per cent. are sold in one or other of the three ways that I have mentioned, and principally is sold as pure meat after the diseased parts are thrown away.

The last International Veterinary Congress that was held in Switzerland in '95, passed resolutions on this point, and reference was made to these resolutions at our last meeting in Nashville. The resolutions then, however, were not at hand and it was not possible to quote them accurately. I now have them before me and I will read them. The Congress calls the attention of all the cities—all of the countries that were represented at the Congress to the necessity of the general introduction of an obligatory meat inspection.

The English people have been considerably exercised over this question of late, and Parliament has appointed, or rather Parliament has authorized the appointment of two Royal Commissions, the first of which reported, I think, in '96 on the danger to man through the consumption of the flesh and milk of tuberculous animals. The second commission reported this year on the administration procedures that should be adopted for controlling these dangers, and in regard to meat inspection.

I might say that the German method is followed as closely as may be in France and, in all of the Continental countries, I think, in its general principles, although of course there are differences, some important differences too, in administration.

Now if it is true that a great deal of the flesh of tuberculous animals can be used without danger, it means a great saving to the livestock business of the country, perhaps not of the west because tuberculosis is very rare here, but to the east where

tuberculosis is more prevalent. I think it is greatly to the credit of the veterinarian profession that by careful inspection so much valuable food stuff can be saved, and the fact that great judgment is necessary in deciding whether a tuberculous animal should be destroyed, or whether its flesh can be used safely, means that trained men only are competent to act as meat inspectors. It can not be trusted to lay inspectors, and that is also a powerful argument in my mind for the employment of veterinarians, and veterinarians only as meat inspectors.

DR. C. A. CARY, AUBURN, ALABAMA.

Mr. President and Gentlemen : I have been assigned the subject of "Reasons for Meat Inspection," but I wish to say as a matter of introduction that I do not expect to talk long or have a long paper upon this subject. I want to add a few remarks to certain things which were said by Dr. Pearson in regard to municipal inspection. I want to say that the union slaughter house in the city of Montgomery, the only city in which we have inspection in the State of Alabama, is owned by a corporation under the control, of course, of the city Board of Health and the city meat inspector, but it would be better if this slaughter house was owned by the city because there would be no unnecessary friction between the operators of the slaughter house and the inspectors then. However, as it is, it is a great deal better than the numerous slaughter houses that were at one time scattered about the city. There is still another point in connection with this that I wish to state specially because of a question of law. When this law was established by the city council to force all the butchers into this slaughter house the question came up as to the constitutionality of the law, and as to whether the law could be enforced or not. Several cases were brought to test the law, and were carried to the Supreme Court. Within the last month a decision was rendered by the Supreme Court which established all the points of the law, that we had the right to establish this central or union slaughter house and that we had the right to force all slaughterers to come it, which was a very important thing to us in regard to establishing this system in other cities in the State.

REASONS FOR MEAT INSPECTION.

The primary object of meat inspection is to protect the health of the public by preventing the sale and consumption of all meat that is dangerous or injurious to human health.

Inspectors should regulate the price of meat from carcasses that are diseased or injured in such a manner that may not make the meat of said carcasses dangerous or injurious to human health, but may reduce the real or nutritive value of the meat. Taking as a basis the market value of average wholesome meat, the municipal inspector should grade all meats that are below the average, stamping or tagging each carcass with its selling price. Furthermore, the municipal inspector should cut out all animals that are too poor to make good edible meat. Some ignorant and unscrupulous butchers must be taught that it takes more than skin and bone to make beef or good meat.

The extension of infectious diseases among domestic animals, as well as in the human family, is materially decreased by the destruction of infectious carcasses and the isolation and destruction of animals that have infectious diseases. In other words, efficient meat inspection destroys the infectious germs and animal parasites instead of permitting them to be scattered here and there to form new centers of infection.

Finally, the inspection of meat increases the consumption and sale of meat without increasing its selling price. Nothing so stimulates the consumption of meat or any staple food as the official assurance that it is pure and wholesome.

According to local observation in America and the records collected by Kjerrulf in Europe, the selling price of meat is not increased by efficient inspection.

PRIVATE MARKET INSPECTION.

DR. CHAS W. HEITZMAN, NEW ORLEANS, LA.

What constitutes a private market is usually defined by laws of the municipality in which they are located. These laws vary according to existing conditions. In many cities fresh meat may be sold in groceries, in fact, anywhere. In the city of New

Orleans private markets only operate as specified by the following law :

An ordinance (7607) providing for the establishment of private markets under certain conditions and regulations, and providing for the punishment of the violation of the same.

SECTION 1. Be it resolved, that hereafter it shall not to lawful for any one to set up or establish a private market for the sale of meats, fish and vegetables or other comestibles, except upon complying with the regulations or conditions imposed under this ordinance.

§ 2. That a private market building used for such purpose shall not be less than ten by fifteen feet in superficial area, sixteen feet in height from floor to ceiling, disconnected from any other building and separated therefrom by a distance of not less than three feet six inches ; which shall be well ventilated, and the floor shall be of flagging or cement pavement. That after the hour of 12:00 M. of each day there shall be no sales made ; that before 1:00 P. M. of each day the stalls and stands in said private markets are required to be washed and cleaned, so as to keep them in the highest state of cleanliness. That after the said hour of 1:00 P. M. the said private markets shall be subjected to the inspection of the police officers of this city, whose duty it is to inspect the same and report any violations of the provisions of this ordinance.

§ 3. That no private market shall be established within twenty-one hundred feet of any public market.

§ 4. That any person desiring to establish a private market shall, upon complying with the provisions above set forth, as to location and construction, evidenced by a certificate to that effect from the city engineer, obtain a license therefor.

§ 5. That whoever shall violate the conditions of this resolution shall be subject to a fine not to exceed twenty-five dollars or to imprisonment in the Parish Prison for a term not to exceed thirty days ; provided that the fine shall not exceed twenty-five dollars or imprisonment for more than thirty days.

§ 6. That all ordinances or parts of ordinances upon the same subject matter in conflict herewith be and the same are hereby repealed.

I bring this ordinance prominently before this convention, because I believe it is a good one. The sanitary conditions, the hours for opening and closing, as prescribed in it, are especially good where market inspection is practiced as in this city.

MARKET INSPECTION.

In dealing with this phase of the subject I must again call your attention to the most estimable law governing meat inspection in this city.

ORDINANCE REGULATING MEAT INSPECTION.

CITY OF NEW ORLEANS.

[No. 13487—Council Series.]

SECTION 1. Be it ordained by the council of the city of New Orleans that from and after the passage of this ordinance it shall be unlawful for any person, firm or corporation to sell or offer for sale or deliver the meat of any animal not considered game, intended for human food, within the city of New Orleans, without same has been first inspected and passed upon and approved by the officers appointed and empowered for such duty by the Board of Health.

§ 2. Be it further ordained, That such meat, when so inspected, passed upon and approved, shall be properly marked or tagged by said inspectors, and same shall not be allowed upon the stalls of any market, whether public or private, unless so tagged or marked, after having been inspected by said inspectors of the Board of Health.

§ 3. Be it further ordained, That this ordinance shall not in any manner affect the sale of salt, pickled, smoked or canned meats of any kind.

§ 5. All parts or ordinances in conflict herewith are hereby repealed, and any and all violations of the provisions of this ordinance shall be punished by a fine of not more than twenty-five dollars nor more than thirty days imprisonment in the Parish Prison.

Adopted by the City Council, July 6, 1897.

Approved July 7, 1897,

A. BRITTIN,

Acting Mayor.

W. R. BRASHEAR,

Clerk of Council.

It can be readily seen that the prime object of the Inspector when visiting these markets is to observe whether all meat exposed for sale therein is properly stamped with the official stamp of the Board of Health. This is a guarantee of its freedom from disease. However, New Orleans, situated as far south as she is, in a semi-

tropical climate, with humidity as a prominent feature, it necessarily follows that decomposition is very rapid. It is therefore of the utmost importance that the Inspector be fully alert to his duty in the examination of meats exposed for sale. While the stamp of the Board of Health is a guarantee of its freedom from disease it is not an antiseptic. Meat bearing this insignia decomposes just as rapidly as if it did not bear this stamp. This is more applicable to the imported refrigerated meats coming as they do in a partly frozen condition, and then exposed to the effect of our atmosphere for several hours, and if not sold returned to the refrigerator or ice box to again be offered for sale on the following morning.

Meat to be unfit for food must not necessarily be affected by disease, as we apply it to tuberculosis, cholera, etc., but a vast danger presents itself in the offering of decomposed or partly decomposed meat for human consumption. While all admit that a certain amount of heat applied to certain germs will cause their destruction and render them harmless, but are we so sure of this protection when applied to the products of decomposition, foremost of which we may mention ptomaines. It is an old fact that animal matter when in a state of decomposition acts generally as a poison, both when taken as a food or when injected under the skin. Many attempts were made to isolate these poisonous products, but it was not successfully accomplished until the years 1873 to 1876 by Selmi, of Italy. He demonstrated that a great number of basic substances could be extracted from putrid matter by treating it successively, with ether, chloroform, amyl alcohol, and other solvents. He also showed that these substances resembled vegetable alkaloids in many respects, and assigned to them the name ptomaines. Since then science has advanced to such an extent that general statements can be given in regard to their origin, composition, physical and chemical properties, and their action upon the animal system.

All organic substances are capable of oxidation ; if rapidly, with the evolution of heat and light, it is combustion ; if it takes place slowly, without the emission of light, decay. When we speak of the decay or decomposition of meat three factors must simultaneously act upon the substance. These factors are, presence of moisture, favorable temperature, and the presence of a substance termed a ferment. The nature of these ferments differs widely, and their true action cannot, in many cases, be explained ; but what we do know is that the presence of comparatively small, often minute

quantities of the ferment is sufficient to cause decomposition of large quantities of certain organic substances. The action of ferments is counteracted by the so-called antiseptic agents : Salt, salicylic and boracic acids, a fact well known to the meat venders.

It has been shown that the presence of moisture, a suitable temperature, and the action of a ferment are the essential factors in putrefaction. The ferments are living, organized beings, termed germs, bacilli, bacterial microbes, organized ferments, etc. While we know that microbe organisms live chiefly in dead organic matter, they also have the power of existing and multiplying in the living organism, causing the decomposition of living tissues, often with the formation of ptomaines.

The poisonous properties of some ptomaines are well marked ; others are more or less inert. The poisonous ptomaines are now termed toxines, to distinguish them from the inert basic products of putrefactive changes. The toxines are of special interest to the physician, because it is now assumed that infectious diseases are caused by the poisonous products formed by the growth, multiplication and degeneration of micro-organisms in the living body.

Let us, as meat inspectors, do our share in stopping the entry of any through the avenue guarded by us.

To distinguish decomposed meat when advanced, does not require the services of an expert ; its odor and its discoloration are usually sufficient to warn the buyer ; but, when just begun, or having received its soda or salicylic bath, or when ground up into sausage and highly seasoned with condiments, then the expert plays his part.

Acting upon the demonstration of Selmi, we have compounded a formula for the detection of decomposed meat, in any stage of decomposition even when the decomposition is in its incipency. It is as follows :

Alcohol, three parts ; ether, one part ; hydrochloric acid, C. P., specific gravity 1 and 16/100, one part. Mix the hydrochloric acid with the ether and cool quickly, and then add the alcohol and the mixture is ready for use.

If a glass rod be inserted into the meat, and the glass rod held near the mouth of the bottle containing the mixture just described, dense white fumes will form if the meat is decomposed, this fuming will take place even if the meat is in the incipient stage of decomposition. Hydrochloric acid by itself will not answer the purpose, as it has been tried. This may be due to two causes : The first, and by far the most objectionable, is

that the hydrochloric acid will fume at all times. The second, if traces of ammonia are in the atmosphere, or the atmosphere be charged with moisture, the fumes will be quite dense. With the mixture described, I can say that it has none of the peculiar properties just mentioned about hydrochloric acid. The principle upon which this mixture is based is upon the fact that when an inorganic ethyl ether comes in contact with ammonia fumes it will produce ethyl-amine, which will combine with hydrochloric acid and produce the ethyl-amine-hydrochloride. The dense white fumes formed when a rod moistened with ammonia is held in the fumes of this mixture, is due to the fact that various amine compounds are formed together with a small proportion of ammonium chloride. The principle amine chloride formed is the ethyl-chloro-amine. It will answer to all the tests laid down in the text books for its detection. This formula may not be new to any of you, but nevertheless it is very efficient.

MODE OF INSPECTING MARKETS.

New Orleans is a city of magnificent distances ; it contains 196 square miles, of which twenty square miles are improved ; it has fifteen miles of harbor front. It has an estimated population of 300,000 inhabitants. To feed this population with meat it requires 25,000 head of animals per month. These animals reach the public through the medium of twenty-six public and two hundred and thirteen private markets. For convenience of inspection these markets are divided into districts ; each district is inspected daily by one or more inspectors, according to the number of markets contained in such district. It is his duty to examine all meat exposed for sale, to observe that all such meat is properly marked or tagged, and to condemn all meat not fit for food. He makes a daily written report, delivered in person, to the office of the Chief Inspector. This report sets forth, in detail, all work done by him. If any violation of the law has occurred it is so reported, and after the investigation by the Chief Inspector, if warranted by the facts in the case, an affidavit is made. In addition to these inspections, a daily re-inspection is made for a two-fold purpose : That if the inspector is not doing his duty this office can be notified, and if something be hidden on his round the second inspector will be apt to catch it. These inspectors are changed as frequently from district to district as deemed necessary by the Chief Inspector.

DANGERS TO MANKIND FROM THE CONSUMPTION OF THE FLESH AND MILK OF TUBERCULOUS ANIMALS.

BY DR. JAMES LAW, ITHACA, N. Y.

The subject assigned me opens a wider field than I am inclined to cultivate at present. So I shall make a selection of a few points only which may be fairly included in the general subject. I propose therefore to place under separate headings some thoughts on issues which I believe to be live and urgent to-day.

THE ORIGINAL IDENTITY AND ESSENTIAL UNITY OF THE BACILLUS TUBERCULOSIS.

Probably, as no one denies this proposition, yet you will bear with me if I state succinctly a few of the conditions which serve to establish this identity. For if all branches of bacillus tuberculosis have come from one common primary stock and if all the varied manifestations of tubercle are but different forms of the same essential morbid condition, it cannot be safely claimed that the seed of the different branches is incapable of developing a product like the same original stock.

1st. The bacillus tuberculosis, from whatever animal derived has a similar, apparently an almost identical morphology. 2nd All alike have peculiar staining properties, which distinguish them from all other pathogenic organisms except the bacillus leprae and the smegma bacillus, the lesions of which cannot be confounded with tubercle. 3rd. Its viability and destructibility; its thermal death point; its destruction by light; its survival of drying, freezing and putrefaction; its propagation through dust, agree no matter what the source from which it was obtained. 4th. In the general susceptibility of a great number of genera of animals to the inoculated germ, and in the special susceptibility of of the common experimental animals like rodents to the germ as derived from different animal sources, we have another strong evidence of an essential unity. 5th. In the usual seats of election for the propagation of the bacillus in the bodies of different

animals, and irrespective of the animal from which the virus was drawn, we find another indication of primary and essential identity. The preference of tubercles for the lymph glands, lymph plexuses and lymph sacs or serous membranes is a characteristic that need not be specially insisted on. 6th. The close similarity of the lesions caused in different animals by the bacilli drawn from the different genera bespeaks an essential identity. The congested miliary nodule or tubercle, with the excessive production of nests of small rounded cells, which tend to degeneration, necrosis and caseation, is essentially the same in all, and while it may be mimicked by certain other lesions such as glanders, it is so in none other having a germ bearing the same characteristics as those of the bacillus tuberculosis. 7th. In all forms of the disease, and from whatever source the bacillus may have been derived, there is the same tendency to a slow evolution of the morbid lesion. 8th. The bacillus tuberculosis from any genus of animal demands for its artificial culture a special culture-medium, glycerined or glucosed as the case may be, while it refuses to grow readily on the common culture media of the laboratory. 9th. The bacillus drawn from any genus of tuberculous animal grows with remarkable tardiness, and does not attain a full development until at the end of about two months. 10th. The culture medium of the bacillus from any genus of animal,—man, ox, or bird,—becomes charged with those products which are collectively known as tuberculin, and to all cases alike these act on the tuberculous system in the same way causing hyperthermia and other nervous disorders. It matters little whether the bouillon had been seeded from the tubercle of man, ox, bird, ape or bear, the resulting tuberculin can be used with confidence in testing for tuberculosis, in any animal.

This ought to be enough to establish the primary and essential unity of the germ. It is useless to ignore the fact that special minor differences may be established between two varieties of the bacillus which have respectively lived for a length of time in two widely different genera of animals, but the original and fundamental unity must be held to more than counterbalance this temporary and slight diversity. The single fact that the hypothetical parent germ has contained the potentiality which evolved under different environments into what we may perhaps admit to be two varieties, virtually establishes the possibility and the probability of the reversion to the original type, when the environment changes and becomes like that in which the original or parent

germ was produced. The elasticity of type in nature and the adaptability of an organism to its environment is a fact which we must always keep in view, in the field of pathology and in what we are pleased to call the normal. But it would be alike illogical and unscientific, to hold to this plasticity of type in one direction and to ignore or deny it in the opposite. If an organism is capable of evolution it must be equally capable of retrogression. The very claim of the evolution of a special variety of the bacillus, therefore, is the best possible evidence that that variety has not become harmless under all conditions to the host from the bacillus of which it has varied.

TRANSMISSION OF TUBERCULOSIS FROM MAN TO ANIMALS AND FROM ANIMALS TO MAN.

The whole history of experimental tuberculosis consists in the conveyance of tuberculosis from animal to animal, from one genus of animal to another, and from man to the lower animals. The experimental animals have been mainly rabbits, Guineapigs, rats, mice, dogs, cats, cattle, sheep, swine and less frequently horses and birds. Apart from the avian tuberculosis, the experimental infections, by inoculation, feeding and inhalation, have been so successful, not to say constant, that the conviction of the essential identity of the bacillus in the different quadrupeds has been generally accepted. The infection of quadrupeds generally by the tuberculous products of man has also been so nearly constant that there is little room for doubt as to the primary identity of the germ in the human and lower animals.

TRANSMISSION OF TUBERCULOSIS FROM MAN TO OX AND FROM OX TO MAN.

The one animal from which man derives the greater part of his meat and milk—the bovine animal—has been by some excluded from this list. The intrinsic value of the animal has prevented its free use for experimental purposes, and a few laboratory experiments, notably those of Kruse and Theobald Smith, have shown that human tubercle may cause a local in place of general tuberculosis in cattle and the opponents of active official measures for the extinction of the disease have seized upon these as alleged proof that the tuberculosis of cattle is in no sense inimical to man. It is incumbent on us to show that the conclusion has been

reached from too restricted premises, and that a wider consideration of the subject would demonstrate that the immediate danger is greater than these contestants suppose, while the remote dangers which come from an adaptation of the bacillus to its new habitat in man are so great that any neglect of this source of infection must be highly reprehensible.

The infection of calves with the tubercle of man was accomplished by Chauveau who, according to Nocard, has shown "that the two maladies under all their forms" (in ox and man) "are equally inoculable upon young bovine animals, and that the consecutive lesions, whether caused by ingestion or intravenous injection, are always identical, whatever may have been the origin of the product inoculated." (*Dictionaire de Med. Veter.*, Vol. 21, p. 476.)

A long list of accidental infections of man from ox tends to corroborate the above.

INOCULATION CASES.

Tscherning attended a veterinarian who cut his finger while making a necropsy of a tuberculous cow. An ulcerating swelling formed which was excised and found to contain tubercle bacilli. The patient recovered without the formation of other tubercles (Nocard).

Pfeiffer of Weimar attended a veterinarian who had been similarly inoculated at the necropsy of a tuberculous cow. The patient, aged 34, had no hereditary taint, and a good constitution. The wound was a deep one, in the left thumb, and healed readily, but six months later there was cutaneous tuberculosis in the cicatrix followed by pulmonary tuberculosis with bacilli in the expectoration, and the subject died two and a half years after the infliction of the wound. At the necropsy there were found tubercular arthritis of the wounded thumb and many vomicae in the lungs. (*Zeitschrift f. Hygiene*, Bd. III).

An honored member of this Association was inoculated on the back of the hand in making a postmortem examination of a tuberculous cow, and the sore swelled, ulcerated and refused to heal, and when excised was found to contain tubercle bacilli. He had no ulterior bad consequence.

Martin du Magny has collected a number of cases of cutaneous inoculation of tubercle, some of which were in butchers and teamsters, and Hanot quotes cases in persons who had habitually handled old bones. (*Senn, Principles of Surgery.*) Riehl and

Paltauf record cases of *tuberculosis verrucosa cutis* in persons accustomed to handle animal products. (Senn). Osler refers to this as the *postmortem wart* (*Verruca necrogenica*) and as common in butchers and tanners. It is also seen in demonstrators of morbid anatomy, and whether derived from, human or bovine carcasses, has a tendency to remain circumscribed. In exceptional cases infection extends to the lymph glands and becomes generalized. (Gerber.)

INGESTION CASES.

Tuberculosis by ingestion is in the nature of things much less clear and definite than is infection by inoculation. With a disease which has a constant tendency to assume a chronic course, the connection of the morbid phenomena with the primary causation factor is likely to be ignored and overlooked. In inoculation cases this is counterbalanced by the occurrence of the morbid action in the cicatrix, which thus serves as an obvious connecting link. But in intestinal infection there is no such ready means of establishing the relation of cause and effect, and the occurrence of manifest intestinal tuberculosis, peritonitis, tabes, hepatitis or splenitis many months and perhaps years after infection is rarely traced to its actual cause. Nevertheless a sufficient number of cases are on record to firmly establish the doctrine of this infection by the products of tuberculous cattle.

Lydtin gives the following case : Dr. Stang of Amorbach was called to a finely developed five year old boy, the son of healthy parents, with no hereditary taint in their ancestors. The boy died a few weeks later with miliary tuberculosis of the lungs, and enormously enlarged, tubercular mesenteric glands. At the necropsy it was learned that the boy had habitually drank the milk of a cow which had been killed shortly before he died and which had shown pulmonary tuberculosis. (Report of Veterinary Congress at Brussels, 1883, p. 288).

Dr. Demme of the Children's Hospital, Berne, records the cases of four infants, the offspring of sound parents, with no hereditary taint of tubercle, which died of intestinal and mesenteric tuberculosis, having been fed on the milk of tuberculous cows. Among 2,000 tuberculous infants treated by Dr. Demme in twenty years, these were the only ones in which he could absolutely exclude the possibility of hereditary taint and other causes. (Report of the Hospital as quoted by Nocard.)

Mr. Howe of North Hadley, Mass., lost a son of 20 months old, from abdominal tuberculosis, three months after he had paid a week's visit to his uncle and had been fed the milk of the uncle's cow. The cow was killed soon after and shown to have generalized tuberculosis. The child's sickness and wasting began a few weeks after he returned home. He had previously been strong and healthy, as were and are his parents. Both the grandfathers had died of tuberculosis when over sixty years of age, also two grandaunts and one granduncle. Only one of these had seen the child and then for a few minutes only. A second child born since the death of the first, and raised on sterilized milk, is strong and well.

The four year old son of Col. Beecher of Yonkers (and great grandson of Henry Ward Beecher), died March, 1894, of tubercular meningitis, and the two Alderney cows which supplied him milk were then proved tuberculous by the tuberculin test and postmortem examination. There was no hereditary taint.

The child of Dr. Brown, U. S. A., and now of Ithaca, was similarly cut off by tuberculosis, having lived on the milk of a tuberculous cow.

Oliver records the case of a twenty year old girl, of vigorous health, and good antecedents, who contracted a fatal tubercular meningitis, having drank the milk of cows having tubercular ulcers on their udders and which were found on slaughter to have generalized tuberculosis. (*Semaine Medicale*, Feb., 1892).

Ernst records the following: A family cow died of chronic pulmonary tuberculosis, from which she had suffered severely for one year. Dr. C. H. Peabody, Providence, found that the tuberculous lungs and heart weighed 43.5 pounds, and extensive tubercles in the mediastinal and mesenteric glands, trachea, tongue, spleen, kidneys, intestines and udder. Three months later the baby sickened and in seven weeks died of tubercular meningitis; two years later a three year old child of the family died of tubercular bronchitis. One year later a boy of five years became weak and puny and died in four years of tuberculosis. The parents were strong and healthy, and one grandparent was alive and well at 68 and another died at 78. (Ernst. *Infectiousness of Milk*, p. 108.)

A. H. Rose, Littleton, Mass., gives the case of a child which fed for three years on the milk of a tuberculous cow, and died with symptoms of abdominal tuberculosis. (Ernst. *Infectiousness of Milk*, p. 110.)

Bailey, of Portland, Me., condemned and made necropsy of a tuberculous cow which furnished the sole milk supply for the family, and found that the wife of the owner, though of sound ancestry, was in an advanced state of consumption. (Ernst.)

Gordon of Quincy, Mass., records the case of the ten months child of healthy parents and ancestry, which had fed on the milk of a cow with advanced tuberculosis, and which died after a few weeks of acute tuberculosis. (Ernst.)

Gage, Lowell, Mass., had an infant patient die of tubercular meningitis. The parents were healthy and surroundings good. It had subsisted exclusively on the milk of a cow, and this milk showed tubercle bacilli and infected guineapigs inoculated with it. A second child, fed the same milk, developed similar symptoms. (Ernst. Report Mass. S. Prom. Agric'l, 1871.)

A Scotch family, strong and healthy, had a herd of cows which contracted tuberculosis. Two young daughters brought up on the milk, died of tuberculosis; while the two older brothers, using little or no milk, remained well and hearty. (Tuberculosis. Nat. Vet. Assn., London, 1883.)

Anderson, Iceland, reports the death from tuberculosis of a child of six months, fed on the milk of a cow suffering from tuberculosis of the udder. The mother developed symptoms of consumption after the death of the child. (Hatch Expt. Statn. of Mass. Agric'l College. Bull. No. 3, p. 15).

Huon gives the case of a cow used in nursing calves, which were employed in raising the lymph of variola vaccinae, and kept strictly by herself and apart from all other cattle. When introduced she had all the appearance of health and gave no reaction when subjected to the tuberculin test. After some time she lost condition and in six months was in an advanced state of emaciation, gave a typical reaction under the tuberculin test and when killed showed extensive (assez grave) tuberculosis. Her care-taker at the vaccine establishment had what was supposed to be chronic bronchitis with profuse expectoration, but when he died soon after this was found to be extensive pulmonary tuberculosis.

These cases are adduced as instances of infection that occur casually, and that are almost inexplicable on any other hypothesis than that of direct infection from the cattle. They form exact counterparts to many cases of experimental infection of the smaller animals by the tubercle of man. They tend to show that the bacillus tuberculosis drawn directly from cattle does not always cause a mere local disease, for in two of the inoculation

cases and twenty ingestion cases generalized tuberculosis was the result. How many cases of local tuberculosis must be assumed to have occurred in the same way, but in which the victims either recovered or lapsed into the latent form : And how many cases in which the disease developed tardily, so as to obviate suspicion as to its true source by ingestion, when its evolution had been sufficiently extensive to lead to its recognition.

Shakespeare, Osler, and most prominent physicians, remark on the prevalence of intestinal and mesenteric tuberculosis in children as pointing unequivocally to the food supply as the source of infection. Comby in *Twentieth Century Practice* shows that tuberculosis of the intestines and *tabes mesenterica* are diseases occurring especially between early and late childhood,—between two and five years. Coming as this does after the child has passed from an exclusive milk diet, it suggests that the disease has been for a time comparatively latent, so that when its generalization calls prompt attention to it, its true primary cause is liable to be overlooked.

The following experimental cases may be added. Two at least show secondary glandular tubercles :

Bollinger made intraperitoneal inoculation of a three months old calf with liquid from a tuberculous human lung, and killed the subject seven months later. Fibroid pediculated tumors, like a pea to a walnut in size, hung from the mesentery and spleen and the mesenteric and retroperitoneal glands were tuberculous. (*Munch. med Wochenschr.* 1894).

Sidney Martin fed four calves 70 cc. sputum containing a large number of bacilli. Three killed after 4, 8 and 12 weeks respectively had 53, 63, and 13 nodules respectively in the small intestines mostly in Peyer's patches. The fourth killed after 33 weeks showed no lesion.

Two calves receiving at one dose 440 cc. sputum containing a large number of bacilli, were killed after 8 and 19 weeks. The first had tuberculous nodules in the intestine and mesenteric glands; the second showed no lesion. (Report of Royal Commission on Tuberculosis).

Frothingham injected into the peritoneum of two calves, three and thirteen weeks old, a culture of bacilli, isolated one year before from the liver of a child. Slight local nodules only were produced some like spontaneous tubercle, others granulation tissue. Two other calves three weeks and two months old, were injected in the trachea. One had a large local abscess in the neck

with a small number of tubercles (without bacilli) in the lungs and liver. The other showed no lesion.

With the advance of the disease along the lymph channels to the glands, lungs and liver there was a promise of further development under more favorable conditions of life.

TUBERCULOSIS OF MAN AND OX CO-EXTENSIVE.

A strong argument for the intertransmission of tuberculosis between cattle and men is found in the remarkable prevalence of the disease in both genera in some regions, and its absence in others.

In the Scottish Hebrides, Iceland, Newfoundland, and the coasts of Hudson Bay, where cattle are few and the inhabitants live largely on fish, consumption is a rare disease. This is not due to the insusceptibility of the natives, for if they migrate to the localities where tuberculosis abounds they fall easy victims.

In northern Norway, Sweden, Lapland and Finland, where cattle are few and largely replaced by reindeer, there is little tuberculosis though the natives live in close buildings through their long and severe winters.

In most of the Pacific Islands there are no cattle, and the natives are comparatively free from consumption. The Hawaiian Islands, of which this was true until after the introduction of European cattle, have since that date become very subject to the disease.

Australia and Tasmania, which forty years ago were so free from tuberculosis that they became the Mecca for the consumptives of England, have under the advent of the victims of the disease and the universal prevalence of cattle raising, become little better than a hotbed of the affection.

Minnesota and the Dakotas were, thirty years ago, in the early days of their settlement, looked upon as nature's sanitarium for the phthisical, but since the advent of a denser population, many of them tuberculosis refugees, and of domesticated cattle, this reputation has been steadily lost. The Indian population within their borders is now ravaged by tuberculosis to an extent to which it is difficult to find a parallel elsewhere.

In the Kirghiz Steppes the Tartars keep large herds of horses instead of cattle, eating their flesh and drinking their fermented milk, and they are remarkably free from tuberculosis.

In China and Japan the lower classes of the people are rice

eating vegetarians, and in spite of confined and unhygienic homes they rarely suffer from tuberculosis. The Mandarin and aristocratic classes on the other hand are beefeaters and in spite of their more spacious, cleaner and better ventilated houses, and their more abundant and nutritious dietary, they are scourged by tuberculosis.

In Italy the mildness of the climate has long attracted consumptives from the rest of Europe, and it has been and remains a hotbed of consumption for men and cattle alike. The sources of the scourge have been recognized for centuries, and have been restricted by legislation. Flick (*Public Health*, Vol. XVI) estimates that in Naples the human mortality from tuberculosis was reduced from 10 per 1000 in 1782 to 1.16 per 1000 inhabitants in 1887. Yet in Italy, as in Algiers, the malady remained as a veritable plague." (Perroncito.) In northern Italy where the restriction laws found little countenance the mortality remains 2.2 per 1000 inhabitants, much lower than that of London or Paris, though higher than in Naples.

Holden tells us that tuberculosis is rare in Columbia, Ecuador and the interior of the Argentine Republic, where, as he further alleges, little milk and no butter are used.

The reservations of the North American Indians furnish the most striking examples of the extension of the scourge of tuberculosis. These wards of the nation are supplied with beef under contract, and according to abundant testimony, have been habitually furnished with inferior and often diseased cattle. These they destroy on their arrival and eat large portions raw, especially of the mesentery and internal organs, the usual seats of tuberculosis.

Treon describes as follows, the result of a fresh arrival of beeves at the Crow Creek Agency: "Saturday early in the morning, the cattle are shot down in the corral, and the Indians drag them out, skin and cut them up. I have observed them frequently, when slaughtering, eating the warm liver, tallow and even the entrails, and great quantities of raw beef. In fact much of the beef is dried, pounded up and eaten without cooking. Frequently they eat animals that have died of disease days before, and to my mind, here is a good solution of the trouble. Supposing that only one out of a thousand cattle received, be affected with tuberculosis, * * from the manner of dividing the beef it is possible and probable that 100 persons may become inoculated by a single diseased animal."

Holden gives the mortality for the Indians in different reservations as follows : At Green Bay, Wis., Tulalip, W. T., and Western Shoshone, Nevada, tuberculosis causes 50 per cent. of the total Indian mortality. (Med. Rec. Aug. 13th, 1883).

In considering the case of the Indians we must of course allow for the filth and confinement of the insanitary huts in which they live. But we must not forget that the Hudson Bay Indian and the Esquimaux live in huts just as close, through a still longer winter, and yet are remarkably free from tuberculosis. But then the more northern native tribes are not supplied with the tuberculosis beef.

Now, a critic may say that these are mere broad generalizations, and do not condescend to the mathematical and bacteriological proof which he is inclined to demand. I would reply that such generalization, when broad enough, and clear enough, may be even more certain and less misleading than a series of laboratory experiments. If we find an infection which absolutely respects and avoids a country until given facilities have been furnished for its introduction, and which then spreads without limit,—if we find such infection advancing in parallel lines, in two different genera when once introduced,—if we find that in the absence of one of these genera which furnishes food for the other, that the disease in the latter is confined within comparatively narrow limits,—if we find that with the prevalence of the infection in the food-furnishing genus, the ravages of the disease develop and increase in the food consuming genus,—and if we find this not in a single case only, but as the rule, have we not the best conceivable ground for the conclusion that the infection is propagated from the first named genus to the second? Would the earnest truth seeker be justified in reaching any other conclusion, unless he could be furnished with the most ample proof of a fallacy in the evidence, and a most irrefragable and comprehensive testimony in rebuttal? Before the days of bacteriology and bactriological experiment, we had through such evidence as that just given, arrived at the firmest conviction that nearly all of our contagious diseases were the result of contagion alone, and that, if this factor could be excluded, the disease would be promptly and permanently exterminated. A persistent clamor was maintained against sanitary restrictions, because the contagious diseases were alleged to arise spontaneously, but a survey of the whole field showed that they never attacked a new country save as the result of the introduction of an infecting animal or its product, and that once introduced they spread all the more

virulently because of the more susceptible soil furnished by the previously unaffected races. This was true of small pox, sheep pox, rinderpest, lung plague, foot and mouth disease, glanders, strangles, rabies, Texas fever.

We were just as certain that these diseases were the result of contagion alone, as we are to-day with all the added light from the bacteriological laboratory. We knew that each and all could be *stamped* out by the prevention of contagion, no less than we do to-day. Bacteriology has come to corroborate and not in any degree to weaken this conviction? Far be it from me to depreciate bacteriology. It has thrown a flood of light upon all these affections; it has furnished us means of differentiation, of prevention, and of treatment which we could not otherwise have attained; it has based our sanitary system upon a new order of facts which we formerly suspected but of which we had not the full demonstration; and so far as it has determined the life histories of the pathogenic micro-organisms, it has largely elucidated the essential nature of the morbid processes induced. It has opened to us a new world and is bound to go on laying bare its as yet undiscovered elements of value. We cannot afford to part with bacteriology, and we cannot afford to undervalue or ignore even the smallest of its facts, but these facts must accord with all other facts in nature, and until this co-ordination shall have been accomplished under our eyes, we must not allow the new facts to negative the old and well established ones.

In laboratory work the expert bacteriologist is often under the temptation to estimate the new truths at more than their intrinsic value, and to accord them a wider application than may be finally warranted by intelligent survey of the whole field. Nothing is easier than to adduce examples of this. Pasteur pronounced pigs and chickens insusceptible to anthrax. Like other experienced veterinarians I had no hesitation in at once pronouncing Pasteur wrong,—not in his laboratory experiments, which were quite correct as regards these animals under the conditions of his experiments,—but assuredly so in his general application of his result to all conditions. To-day the whole world recognizes the susceptibility of chickens and swine under given conditions. Koch, on the basis of his laboratory experiments, proclaimed tuberculin to be nature's great cure for tuberculosis. I could never place any trust in its therapeutic utility for the reason that tuberculosis often persists for a long lifetime (the infected system all the time producing and circulating its own tuberculin) without

any satisfactory manifestation of a curative action. The tuberculosis infection is only to a very limited extent self-restrictive, and there are to-day few remaining devotees of the Koch cure. It is now allowed that many cases of incipient and slight tuberculosis recover, but the deadly trend of generalized and advanced cases forbids the assumption that tuberculin is curative. Roux and Chamberland found that 300 times the fatal dose of a culture of bacillus tetani was rendered harmless if it were first mixed with the blood-serum of an immune animal, but their claim of the curative action of this serum was very largely negatived when the serum was used upon men and animals which were already suffering from the tenebric spasms. It proved of more value as a prophylactic before the toxins had already established their action on the nerve cell.

But if bacteriologists need to be careful as to the extent of the claims based on given laboratory experiments, how much more should the layman be guarded as to wholesale deductions from limited observations. We have no complaint to find with the bacteriologist. Every well conceived and carefully conducted experiment is a new source of knowledge, and serves to enforce or qualify the knowledge to which we had previously attained. The scientist himself aims at the promulgation of the new facts without detriment to other truths which have already been well established. Sooner or later he can enlighten us upon the conditions which determine the older truths and those in which the new ones have sway, and the fields of science and sanitary work are commensurately enlarged, and placed upon a broader and more substantial foundation. But when the ambitious layman gets hold of the solitary new result of laboratory work, he is not always deterred from giving it a world wide application, by any knowledge of old-established truths, or scientific sense of the many-sided work carried on in nature's laboratory. In this, more than in most other fields, "a little learning is dangerous," and under the wrong inspiration proceeding from an observation which is given a too wide application, beneficent work is liable to be arrested and grievous evil wrought.

The bacteriology of contagious diseases is as yet in its infancy, and the field of investigation which it opens up is almost illimitable. The laboratory experiment is perfectly trustworthy when we take into account all the conditions in which the result was produced, but when we apply this result generally, without taking into account the infinity of modifying conditions in the microbe,

its recent life history and its environment, we are certain to fall into error sooner or later. An animal that is habitually insusceptible to anthrax or blackquarter becomes strongly susceptible when a little lactic acid is added. And such lactic acid is easily developed in the system by muscular work. Active exertion will, therefore, undo the force of the alleged immunity. The otherwise immune rat becomes very susceptible after he has been made to work at turning a wheel. Similarly the germ which has been rendered harmless to a given genus of animals, by cultivation in a given environment, is still often deadly to the newborn of the same genus.

It is not the accomplished bacteriologist who is to blame in this matter. Dr. Theobald Smith found that the bacilli from human sputum grew more vigorously than the bovine bacillus on dog's serum, that it stained less deeply, that it tended to grow less short and more slender, and that it produced in rabbits only temporary drowsiness and recovery in two weeks. But he gives as freely the opposing indications. One sputum bacillus grew so feebly in dog's serum that its culture was abandoned. He recognizes that fifty per cent. of all bovine cases derived from bovine sources, remain localized. He states that "variations in the dose result in corresponding variations in the length of the disease, in its final termination, and in the extent and distribution of the lesions." He mentions as a possible theory that the long semi-saprophytic life of the sputum bacillus may have lessened its pathogenic power, yet he found in one case that the bacilli from an acutely tuberculous lymph gland was even less pathogenic than that from the sputum. He acknowledges the probability of the transmission of the bovine bacillus to man in these words: "It seems to me that, accepting the clinical evidence at hand, bovine tuberculosis may be transmitted to children when the body is overpowered by large numbers of bacilli as in udder tuberculosis or when certain unknown favorable conditions exist." Again in view of the assumed lessened susceptibility of man to the bovine bacillus, he says, "The occasional entrance of bovine bacilli into the human body might open the way for the introduction of a virus of a higher level, provided opportunity for subsequent transmission be afforded."

These points culled from advanced sheets of his paper which Dr. Smith has kindly sent me, show that his position is not extreme nor objectionable in this matter, and the danger comes

mainly from a misapprehension of his true position by men who come to the question with minds warped by prejudice.

In this connection it is important to note Nocard's latest observations, that the bacillus of human sputum produces lesions in the Guineapig having the character of those caused by the avian bacillus, and that the bouillon cultures of the human bacillus, when enclosed in collodion capsules and subjected to cultures of 3 to 6 months, in the peritoneal cavity of the chicken apparently assume all the qualities of the avian variety. After three such passages through the fowl of 4 to 6 months each, the collodion imprisoned bacillus kills the fowl upon which it is directly inoculated, producing the characteristic lesions of avian tuberculosis.

Without, therefore, in any way detracting from the value of the experiments of Kruse and Smith showing the production of a local tuberculosis in cattle from inoculation with the tubercle of man, or of the results of accidental inoculations in which local lesions only have occurred in man from the implanting of the tubercle of the ox, we cannot safely discard the equally well attested facts of generalized tuberculosis from both forms of infection, and of the habitual prevalence in the same localities over the whole world of tuberculosis in man and ox.

Further experiment is wanted to clear up questions that are yet obscure. What varied conditions beside those already known tend to render the bovine bacillus less adapted to propagation in man? What conditions render the bacillus of man less adapted to the ox? What conditions in the human and bovine systems respectively render them severally specially susceptible to the bacillus from the other genus? We recognize differences which we cannot as yet trace to their intimate causes. We habitually find the greatest difficulty in starting a culture from the living animal on the culture medium usually employed. But when once started there is usually no difficulty in continuing this culture indefinitely in the artificial medium. We cannot yet fully explain the difficulty in the one case and the facility in the other. We wait hopefully for the light which bacteriology and physiological chemistry must one day throw on these questions. Meanwhile we must keep all the known facts in mind, and in our sanitary work guard against the dangers which come from a too exclusive attention to one class of facts.

VOLUNTARY MUSCLE OF CATTLE SELDOM TUBERCULOUS.

Keeping this principle in view, we must recognize that the voluntary muscles of bovine animals are less frequently affected by tubercle than is the case with that of the other domestic animals. They are therefore less liable to convey the infection through ingestion of the flesh than are pigs. A partial truth is assumed to be a general one and it is claimed that beef is never dangerous. But here again the truth lies midway. The muscular tissue of cattle is sometimes the seat of tubercle, though less frequently than in pigs, and the lymph glands that lie among the muscles are quite frequently involved in cattle. It is therefore dangerous and misleading to assume that all raw beef is harmless, and even when sound it is always liable to contamination with hands and knives, when tubercle exists in intermuscular glands or in internal organs.

NONINFECTING MEAT AND MILK MAY CONTAIN THE
PYROGENIC TUBERCULIN.

Another point which cannot be ignored is the presence in the blood and milk of tuberculous cattle of the thermogenic product of the bacillus. We know that if this is injected subcutem into the tuberculous man it develops fever, and stimulates the inflammatory and necrogenic processes in the seat of the tubercle. This last process is especially noticeable in lupus. The milk therefore and the meat may be entirely free from the tubercle bacillus, and yet may hasten the generalization of the tuberculosis in the already infected consumer. This is comparable to the constant reinfections established in the tuberculous animal confined in a close building with other consumptives or with an accumulation of its own products. In either case the tendency is to hasten the disease to a fatal issue.

But here again there is a qualifying circumstance. It is a function of the liver to decompose and render harmless the toxins which reach it through the portal vein. Hence, much larger doses of tuberculin can be given by the mouth than by hypodermic injection.

A certain proportion however may escape the sanative action of the liver in connection with hepatic derangement or accelerated circulation, and this is likely to prove a constant stimulus to the advance of the disease.

There is always the further danger that the infecting bacilli from which the tuberculin is being formed, may suddenly become generalized, being washed on with the circulating blood, so traversing all the vascular tissues, colonizing in one or many of the organs, and escaping in the milk or other secretion.

I have hinted at a few of the dangers attending the consumption of meat products from tuberculous animals. The subject of the sanitary care of such animals has not been assigned me. I shall say this, however, that the nature of such sanitary work will be influenced largely by the object. If the aim is the final extinction of the bacillus tuberculosis we cannot be too careful to close all avenues by which it may gain access to the system of man or beast. If, on the other hand, we aspire only to a restriction of its prevalence, it may serve the purpose to destroy only the badly diseased and to condemn only the badly affected products, while the slight, latent and recoverable cases are in a measure ignored.

SLAUGHTER HOUSE INSPECTION.

BY S. STEWART, KANSAS CITY, KANSAS.

The establishment of Slaughter-House Inspection by the government at the large slaughtering establishments, doing a foreign and interstate business, has served to attract attention to the necessity for careful inspection at all slaughter houses supplying cities and towns with animal food products. In order that slaughter house inspection may be all that public health requires that it should be, several conditions must be harmoniously conjoined. There must be legal authority to conduct inspection and enable the inspector to enforce necessary regulations. There must be a substantial moral support on part of the public, both general and official. The inspector must be thoroughly competent.

If inspection be established under the authority of a local or state board of health, the power for enforcement of its rules is usually ample and easily applied. When the authority for inspection is through municipal ordinance, political influence is a forceful factor, often rendering uncertain the official position of the inspector, and not infrequently determining a vacillating and biased service, with laxness where financial or political force is applied.

If inspection be intelligently and honestly conducted, and the public kept informed as to the work done through official reports, public sentiment will lend strong moral support to this kind of sanitary service. No one thing will create stronger public approval and more general satisfaction than the assurance that the food upon the table is not tainted with disease.

The qualifications of the inspector for the duties of his office are important factors in the establishment and maintenance of a service which fully protects the public and yet does justice to the owners of animals slaughtered. He should possess a thorough knowledge of the anatomy of domestic animals and have a good working knowledge of comparative pathology. He should be familiar with the ante-mortem symptoms and post-mortem lesions of the more common diseases and possess the mental acumen to

trace out and determine the rarer ones, and withal judge fairly as to the influence any disease or morbid condition may have on the wholesomeness, as human food, of the flesh of an affected animal. He must be honest, courteous and discreet. Inspection may be carried on without serious conflict with the slaughterers if the inspector condemns with discretion, and has the tact to explain in simple language why he condemns when objection is raised by the butcher or owner. In this way they may be led to have confidence in the inspector and will manfully bear their losses when unfit carcasses or organs are condemned and destroyed as food.

We may class as positively dangerous, both for food and to handle, the carcasses of animals affected with anthrax, rabies, septic conditions and the malignant oedema and foot and mouth disease of Europe ; as dangerous and suspiciously unwholesome, those affected with tuberculosis, actinomycosis, Texas fever, erysipelas, sheep pox, hog cholera and swine plague, or any disease producing elevation of temperature ; also beasts which have died before slaughter or must be killed to save them, and flesh saturated with oedematous fluid or blood.

There is a class of meats which is decidedly disgusting and loathsome, though not positively harmful as food, such as the flesh of animals which were drowned, smothered, or died of apoplexy ; females in the parturient state, or its near approach ; unborn or recently born young ; animals fed on loathsome offal ; flesh which emits an unpleasant odor ; and flesh containing parasites, such as trichinae and cysticerci, the last two being harmful if consumed raw.

Flesh may be considered wholesome in cases of recent injury, localized diseases of single organs of a chronic, non-malignant character, or localized parasitic invasion, the parts involved having been removed.

The interest of the owner of meats under inspection is to be considered in connection with the health and prejudice of the consuming public. It will be observed that popular and personal prejudices play quite an important role in this connection. Persons not accustomed to seeing animals slaughtered and the parts or organs prepared for food, are often disgusted with many conditions and products, which are perfectly wholesome ; and others, who do this work or constantly see it done, become accustomed to and consider wholesome many conditions of flesh which may be decidedly harmful or loathsome to the general public. The pub-

lic should be properly protected from the ignorance or rapacity of the butcher, and the owner or slaughterer of animals be protected from the ignorant prejudices of the public.

Examinations made before slaughter are highly important. Considerable enlargements of any of the tissues about the head, neck and limbs are easily discernible ; gangrenous wounds and skin diseases will be noticed, and the sick or bruised animal which gets out to one side by itself, or lies down while the others stand or walk about, will not be overlooked ; also the class known as "downers," or cripples, which cannot or will not walk to the slaughter house, may be seen. Special attention should be given to such animals during the post-mortem inspection, for the wily butcher knows how to skillfully cut away evidences of disease while removing the skin, limbs and head.

If the slaughtering establishment be a small one, and the examiner has abundant time to leisurely watch the entire process of slaughter, no abnormal or diseased condition need escape his notice, but in large abattoirs, where 100, 200 or even 500 animals are slaughtered per hour, the process of dressing is done in parts, at several points along the journey of the carcass from the killing bed to the refrigerator. The head, feet and visceral organs are quickly removed to another part of the establishment, so the evidence of disease must be seen quickly, if at all, and the carcass of which they were a part be identified. Still greater acumen must be exercised in small abattoirs where the carcasses are dressed and viscera set aside to be examined at the convenience of the inspector.

During the transportation of cattle by railroads to the markets many are injured. These injuries vary from slight bruises to extensive contusions of the soft parts and fractures of the ribs, vertebrae or bones of the extremities. Ten to thirty hours after infliction these injuries are manifest in the live animal by swelling and puffiness over the seats of contusion, and if extensive the animal moves about very stiffly, as though foundered. If the ribs are broken the injured side is protected as much as possible by muscular rigidity on that side. If a femur, ilium or vertebra is fractured, the animal will be unable to rise, and must be hauled from the car or yards to the slaughter house in a cart. Sometimes cattle get down in an over-loaded car and cannot get up, owing to the crowded condition of the car. They are trampled on by the others and after much struggling become discouraged and will not get up ; or during a rainy or an icy period cattle slip, violently separating the hind legs at right angles to the median line of the

body rupturing the muscles in the pubic region, perhaps fracturing or dislocating the femur or other bones. These animals are known as "downers." When slaughtered the cases of severe injury of more than twenty-four hours' standing do not bleed so freely nor so perfectly as a sound animal. When the skin is removed contusions recently inflicted are easily discerned, the subcutaneous connective tissue and fat being infiltrated with blood escaped from ruptured capillary vessels. If the contusions be extensive as when a bullock gets down in a car and is repeatedly trampled upon, the fat and connective tissue of the back and sides of the body are torn and pulpified to such a degree that the skin is removed from the injured parts by very slight traction, and the surface of the body is discolored over large areas. The contusions may extend deep into the muscular structures, even through the thoracic or abdominal walls, being accompanied by hemorrhage into the parts, pulpification of the muscle structures and sometimes fracture of ribs. If the injured animal be not slaughtered before febrile conditions are established, the injured tissues will become infiltrated with an exudate, varying in color and consistence from a gelatinous amber-colored serum to a thin, dirty fluid, with sometimes a disagreeable odor. The expert butcher deftly removes the hemorrhage-stained, infiltrated and torn fat and connective tissue overlying the muscular structures, also the superficial muscles, if coagulated blood and serum be found in and beneath them; then with a brush and plenty of very hot water the smaller hemorrhagic discolorizations are softened and washed away, the parts presenting a nearly normal color when dried and placed in a refrigerator until thoroughly cooled. When the injuries are recent, as indicated by the absence of the products of inflammation, the bruised and torn parts can be cut away, leaving the remainder of the carcass wholesome food and not offensive in appearance. In the cases where the serous exudate is extensive or malodorous, or where rigor mortis is established before the skin can be removed, changes have taken place in the fluid and solid tissues which render them suspiciously—if not certainly—dangerous for food, and they should be condemned.

The class mentioned as "downers," or cripples, naturally require especial attention, yet when slaughtered and dressed it is often difficult to discern any sufficient reason why some would not or could not walk to the shambles, so slight are the tangible lesions. Many of them present lesions of the bones and contiguous soft parts, and the same principles apply in determining the whole-

someness of the flesh as though these animals walked to the slaughter house.

Large suppurating wounds from punctures, gunshots or branding irons, or gangrenous wounds are sufficient cause for rejecting the bearers for food purposes. Such animals are usually in a declining physical condition, which fact makes it highly suspicious, if not certain, that the structures of the body are deleteriously influenced by poisonous elements carried from such wounds. If such wounds be small and post-mortem sections of the surrounding structures and contiguous glands show them to be normal in color and consistence, the removal of a liberal portion of the structure surrounding such wound should render the carcass unobjectionable.

Actinomycosis is the most prevalent disease of cattle in this section of the country, and in at least 80 per cent. of the cases in cattle offered for sale at the market the lesions of the malady are confined to the structures of the head and neck. Indeed, in most cases it is a local affection, in no way affecting the general system, excepting as it interferes with prehension, mastication and deglutition of food. The majority of cases involve the inferior or superior maxillary bones. In all these cases coming under my notice there were found to be from one to six or more fistulous tracts, discharging into the cavity of the mouth. These fistulae are to be found before the disease has reached sufficient development to be observable by visual examination externally, and long before the overlying skin has been involved in any degree. A careful examination of the internal organs of many cattle having actinomycosis of the maxilla in the early stage but with fistulae in the mouth has failed to reveal the involvement of any visceral organ. As stated before, the lesions of the disease are to be found usually in the tissues about the head and neck. When the soft structure only are involved it usually begins in one or more of a chain of lymphatic nodes, extending from the mouth to the thorax, most frequently in the sub-maxillary region. The disease processes set up in these nodes destroy them and in their stead is developed a dense, thick-walled sack of variable size, containing a whitish, odorless fluid or semi-fluid mass, which, it is claimed, "consists of detritus resembling pus but lacking the specific micrococci which are always present in pus." The skin over these tumors may be involved and a fistula established, the external end of which is surrounded by a granular growth, which necroses on the surface, giving off a very offensive odor and has a disgust-

ing appearance. Extension to other parts is more frequent when the disease is glandular in character.

In about 20 per cent. of cases the fungus invades the soft parts about the head and neck, many of these present actinomycotic growths in the lungs and occasionally the liver and intestinal structures are invaded. The disease appears to extend along the lymphatic channels rather than to find dissemination through the general circulation. Out of several thousand of cases only two were reported as generalized, and careful inquiry showed no involvement of the muscular structures but was confined to the head, neck glandular structures of the cavities and I question if these cases were not pyemia coincident with actinomycosis. Actinomycosis of the tongue is very rare.

When the bony tissues, the parts invaded by the actinomyces, the characteristic proliferation of the osseous and periosteal tissues attain dimensions which give it the popular name of "big jaw." The fungus destroys the bone and its covering, supplanting them with a new growth of fibrous tissues, enclosing masses of granular tissue, in which is imbedded small yellowish points of gritty, purulent fluid, the hard grains being clumps of the specific micro-organism of actinomycosis. When the overlying skin is involved, the surface presents one or more granuloma, which surrounds fistulous openings through which a purulent fluids escapes. If these growths have not interfered with the general health of the animal, sentiment is the most tangible reason for condemning the carcass.

Tuberculosis is found in a small per cent. of the cattle slaughtered in the valley of the Missouri, being found principally in cows over five years old, but is occasionally found in calves and young cattle. No structure of the body is entirely exempt from disease processes set up by the tubercle bacillus, but there is a much greater tendency for the germs to establish themselves in the lungs, thoracic glands, and mesenteric glands, and then spread to other contiguous organs or tissues, or becoming generally disseminated throughout the body. The bacilli, by their active presence in a tissue, induce a new growth about them which, if it be near or on the surface, projects or stands out like granules. These growths are called "tubercles." They are found scattered through the substance of glands and other structures, or on their surfaces. This form of development in the serous membranes constitutes what is known as "pearl" disease. Tubercles are often agglomerated into masses from the size of a pea to an egg, and

even attain the weight of ten pounds or more. Tubercles or masses when found on free surfaces have the appearance of granulation tissue, but when cut across the centres are found to consist of semi-solid, whitish, caseous material, and in chronic cases may contain small particles of lime salts, giving this cheese-like substance a gritty feeling to the touch. Sometimes the necrosed tissue in the tuberculous glands of the neck and thorax and in large tubercular masses in the substance of the lungs and liver, may be liquid or partly liquid. It is a very difficult matter to detect the tuberculous animal when confined with others in slaughter house yards, as there are no pathogenomic signs which plainly and certainly distinguish it from the non-tuberculous, unless it be in the cow bearing the tuberculous udder and contiguous lymphatic glands. By tactile examination any considerable development of tubercle in the lymphatic glands above and behind the udder, or in the udder itself may be recognized by the nodular character of the induration present. The non-tubercular induration of this organ giving a more uniformly smooth surface to the touch.

Upon post-mortem examination the observer will readily discover when present the granular appearing tubercular growths on the serous surface covering any viscus, or lining the thoracic or peritoneal cavity. I know of no normal or other pathological condition presenting a similar appearance. These growths are nearly always present either in the thoracic or peritoneal cavity, in cases of generalized tuberculosis. The serous membranes lining the thorax and abdomen are easily torn out and with them these tell-tale evidences of generalized infection. Enlarged lymphatic glands and abnormalities in appearance of the visceral organs will attract attention, by section of which the character of the disorder may be determined. It is differentiated from actinomycosis by the small yellowish points and the actinomyces grains of the latter disease, and from parasitic and other abscesses by the character of contents, and the presence or absence of like lesions elsewhere, and if necessary by aid of the microscope. In ordinary postmortem examinations in slaughtering establishments, the inspector should have time to minutely examine the entire carcass in cases in which the gross lesions are confined to a single organ or gland; even then he cannot always discern whether generalized tuberculosis is in process of development from the localized form. Color, odor, texture, fatness or leanness give no hint of such extension of this disease. I have seen very fat carcasses which were actually studded with tubercles all over the external and internal sur-

faces, as well as their being profusely interspersed throughout the muscular tissues. Of course many cases are emaciated. Localized tuberculosis whether it be in lymphatic or mammary gland, in lung or liver, does not apparently modify the physical appearance of the carcass.

There seems to be a great diversity of opinion as to the wholesomeness or unwholesomeness of the flesh of tuberculous cattle, even in Europe, where several international congresses have debated the subject at great length. The consensus of opinion seems to be that in all cases of generalized tuberculosis the carcass should be condemned, and when localized the flesh may be safely used for food.

The disease known as "Texas fever" or "Southern fever" may be recognized in the living animal which has been driven to the abattoirs for slaughter, if it is allowed to become quiet, for as soon as the excitement of the drive is past the sick animal assumes a characteristic position. The back is arched, the limbs are spread apart to enable it to stand steadily, the head is dropped low, the ears fall downward and forward, or the animal may lie down, when the head is carried around to the flank, as in parturient apoplexy. If a thermometer be employed, it is usually found that the rectal temperature is 103 degrees to 106 degrees Fah. Should the animal void urine, the dark wine color will be very noticeable, and when the sick animal is made to walk, after a period of rest, a staggering gait will attract attention. If it be docile an examination of the visible mucus membranes may be made, but in range cattle the prudent inspector will dispense with the information to be so acquired, for animals sick with Texas fever are more excitable and vicious than healthy cattle. The presence of ticks on the escutcheon, thighs, flanks and elsewhere confirm the diagnosis.

When an animal sick with Texas fever is slaughtered, the examiner will find the spleen greatly enlarged, its capsule easily torn, and the substance of the gland quite black and very soft, sometimes partly liquid, so that considerable of the splenic mass will gravitate to either end of the capsule if suspended by the other end. The liver is much enlarged, and changed from a brownish to a mahogany color, also somewhat mottled on cut surfaces due to being irregularly stained with coloring matter from the blood. The gall bladder is distended with a very dark, tarry, viscid bile, in which is suspended a quantity of yellow flakes, which will deposit upon standing. The urine contained in the bladder has a dark red to port wine color, and the kidneys will be found con-

gested. Other visceral organs present no characteristic lesions. In some carcasses the tissues have a yellowish tinge and the fat a bright lemon yellow shade. In other carcasses the color of the flesh is normal but the cancellous structure of the bones is stained dark like the urine.

The foregoing presents the principal ante-mortem symptoms and post-mortem lesions of an acute disease fully developed. In this type of case an inspector would not be in doubt as to whether or not an animal is diseased, nor as to what disease it is, neither would he hesitate concerning its condemnation. In the same bunch of cattle in which this typical case is found, there will probably be others in which this malady is just beginning to develop or is partly developed. The structural changes in the spleen and liver are not so marked, perhaps scarcely discernible. The disintegration of blood corpuscles may not be sufficient to stain the urine highly. Or the case may be of a very mild type. It will tax the judgment of an inspector to rightly determine whether or not the animal is infected; whether or not the disease is sufficiently developed to render the flesh unwholesome, this disease not being communicable to man.

Advanced pregnancy or the parturient state though normal conditions, should reject the cow for slaughter. Sentiment renders the flesh of such unappetizing, as well as the flesh of the unborn or recently born calf. Local regulations usually require the calf to be four to six weeks old, or to weigh at least seventy-five pounds when dressed.

Extreme emaciation from any cause so modifies the tissues that the carcass does not become firm and dry in the refrigerator, like normal flesh, and accordingly is very deficient in nutritive qualities and should be rejected.

Leucocythemia or leukemia is occasionally found on the slaughter beds. Enlargement of the lymphatic glands and spleen are the abnormalities which attract the attention of the inspector. In the several cases coming under my notice the animals were in thin flesh, presenting the appearance of general unthriftness. The spleen was many times the normal size, and the lymphatic glands in all parts of the body were from two to ten times the usual diameters, cross section of which presented a normal appearance. In well marked cases condemnation is indicated.

Non-specific inflammation of every viscus is occasionally found and the disposition of the carcass must be determined by the stage of development and extent and character of, perverted func-

tional activity. It is conceded that high bodily temperature, long continued, impairs the quality and character of flesh, rendering it unappetizing, noisome and suspiciously unwholesome.

Acute inflammation, as well as chronic structural changes of the kidneys are quite apt to escape notice, owing to these organs being imbedded in considerable fat. Any considerable interference with the renal functions soon leaves the tissues charged with waste products, which prevent the usual firming of the flesh, it remaining soft and sticky or clammy to the touch and gives out a loathsome urinous odor. Such flesh should be condemned.

Cold abscesses may be found in all parts of the animal carcass but are most frequently found attached to a thoracic or abdominal viscus. There is very rarely more than one in any individual and they vary greatly in size. They are most frequently found in young, highly developed and rapidly fattened cattle which present every appearance of perfect healthfulness. They consist of a very dense limiting membrane enclosing a whitish, odorless purulent fluid which is rather gruesome to look upon, but innocuous. There is no morbid disturbance in the structures contiguous to such abscesses, and they can be enucleated leaving the carcass wholesome food.

An occasional case of pyemia or multiple abscesses throughout the body is met with. Investigation usually reveals the source of infection in a suppurating wound or purulent inflammation of the uterus or serous membrane, these are cases of septic infection from a retained fetus or placenta, or from a gangrenous organ or wound will call for condemnation. The carcass in such cases gives out an offensive odor and does not dry and harden when placed in the cooler.

Genuine jaundice is seldom seen and when found indicates condemnation. A pseudo-jaundice is very abundant and is due to the peculiar coloring of fatty tissues. It will be noticed that the fat of animals which are in a thriving and improving condition is yellowish white, and the fat of those in a retrograding condition is more highly colored, even acquiring a dark orange yellow color, giving the carcass a jaundiced appearance.

Some southern cattle are infested with flukes. These parasites may be sufficiently numerous to channel the liver in all portions and stimulate new growth of tissue elements sufficiently to double or quadruple its normal size, yet the appearance of the carcass is normal and appetizing. The liver alone is rendered objectionable.

The *cysticercus bovis* is very rarely found in cattle coming from the region west of the Mississippi river. The cysts are usually most numerous in the muscles of the cheek, they are about the size of a navy bean and consist of a cyst wall enclosing a small tapeworm head and a quantity of limpid transparent fluid. The presence of this parasite (one source of tapeworm in man) indicates condemnation.

Sheep which come to the western markets are less subject to disease than cattle and hogs. The most frequent cause for condemnation is emaciation. Some of the sheep from Mexico, New Mexico and Colorado are infested with tapeworms which are so numerous in the small intestines and bile ducts that the nutritive functions are greatly interfered with. There is no fat and little muscle on the carcass, and that little is so devoid the normal constituents that it remains soft and flabby under the same conditions in which the carcasses of healthy, well nourished animals become dry and firm.

Jaundice is quite common and seems to be dependent upon pathological derangement of the liver, usually inflammation of that organ, but occasionally atrophy or sclerosis of the hepatic tissues. Some cases of jaundice found in sheep shipped from western ranges are probably cases of ictero-hematuria; the spleen is large, the liver is black and friable, the bladder full of high colored urine, the skin and other tissues stained intensely yellow. Condemnation is indicated in these cases.

A disease somewhat resembling tuberculosis is found in sheep grazed on the plains of Colorado and Utah. It is characterized by the development of caseous masses in the lungs and thoracic glands, the glandular masses often becoming two to three inches in diameter and even greater. I do not remember to have seen the extension of this disease to any tissues or organs outside the thoracic cavity. The disease is essentially chronic and apparently does not interfere with the thriftiness of the animal until large areas of the lungs and numerous glands are invaded and destroyed. When the health of the animal has been impaired by this disease it would seem self evident that the carcass should not be used as food. In all cases the organs invaded should be destroyed.

Another disease somewhat resembling tuberculosis is found in the walls of the intestines and in the mesenteric glands. It consists of nodules of various sizes made up of adventitious tissue enclosing caseous pus, and sometimes there is found in addition small round worms, the *Hypostomum Columbianum*. This is known

as the nodular disease, and its only apparent effect is the rendering of the intestines valueless as sausage casings. In all wounds, abscess, septic conditions, advanced pregnancy, etc., the same rules for condemnation apply as in cattle.

Many sheep are the bearers of the cystic *taenia marginata*, (bladder worms) which are mostly found attached to the folds of the peritoneum, as they are harmless to man the carcass is wholesome food, but butchers should be required to remove all cysts and put them into the furnace or retort (in order that they may not be thrown to dogs, in whose intestines they become mature tapeworms).

A few cases of scab have come under my notice, in which inflammatory processes extended beneath the skin. The animals were anaemic and apparently subjects of septic poison. These cases were condemned.

Swine are subject to bruise and fracture during transportation, also to many diseases identical with those of cattle, and the same principles apply to determining the wholesomeness of the flesh for food. There are some special diseases of swine of which hog cholera and swine plague are the most important. These two diseases are frequently associated in the same animal.

It is the common custom of stock owners to ship their herds to market when contagious diseases develop in them, regardless of their fitness or fatness and sell them for what they will bring, in order to avoid a greater financial loss. More especially is this the case when the animals are swine affected with cholera. In the stage of invasion or in mild cases none of the physical signs are sufficiently marked to indicate the diseased hog when driven into the slaughtering pen, but in the more advanced stages of ordinary virulence, the sick hog lags behind, has a staggering gait, may cough violently, and is so exhausted by a short drive that a spasmodic action of the diaphragm (commonly called thumps) is present in many cases. When allowed to stop the snout is dropped to the ground, the back arched, the abdomen tucked up, and vomiting, purging or both occur if the animal has access to water, which follows its endeavor to quench an insatiable thirst. Red discolorations of the skin are usually present in various parts, the ears are frequently swollen to twice or three times the normal size and thickness and occasional necroses of the skin and subcutaneous tissues occur upon the ears and other parts which have been bruised. When slaughtered, and the hair and cuticular layer of the skin are removed in the usual process of preparing

the carcass for food, the hemorrhagic discolorations of the skin which are present in nearly all cases of cholera will attract the inspector's notice. These discolorations vary from a bright red color in recent cases to a dark gray pigmentation in convalescing cases. They may vary in size from small lenticular spots on the legs, jowl and neck, to blotches several inches in diameter situated on any part of the body.

Strokes of the whip or other light contusions of the skin will produce light red marks in healthy hogs, but in cases of cholera the color is dark red and extends a considerable distance from the injury.

Hemorrhages also occur into the subcutaneous fat from very slight contusions and show as dark spots under the skin. In cases of several days standing these hemorrhagic areas often necrose, and an incision through the skin reveals a quantity of dirty brown putrid fluid. The overlying skin will slough if the animal lives long enough. The lymphatic glands in all parts of the body present hemorrhagic lesions, which vary from redness of the periphery to a dark bloody discoloration of the entire glandular mass. Extravasations of blood beneath the serous membranes are often quite extensive, especially in the lungs, mesenteric folds and leaf lard. In mild cases the kidneys are studded with minute points of coagulated blood, and in violent cases the pelves and capsules may contain extensive clots of blood. The characteristic exudation nodes (buttons of Welch) and ulcerations of the intestinal mucus membrane are rarely difficult to find, especially in the region of the ilio-caecal valve and may be confidently looked for to confirm a doubtful diagnosis. The hemorrhagic lesions of the skin, lymphatic glands and serous membranes are usually sufficiently marked to render a diagnosis certain, but these lesions are sometimes very slight, and an examination of the intestinal tract may be necessary to determine whether an incipient pneumonia or false membrane present, in a given animal, is due to cholera and swine plague, or other causes. The hemorrhagic lesions are often not conspicuous and may be readily overlooked when hogs are being slaughtered at the rate of 200 to 500 per hour. Swine plague is usually manifested by a congested condition of the skin covering a large area, either one-half or two-thirds of the entire carcass giving it the appearance of a deep red blush. The internal lesions are most pronounced in the lungs, being a form of pneumonia in which yellowish points are discerned, these points being necrotic spots or centres. The serous surfaces of the lungs, as well as all other

serous surfaces may be covered with a fibrinous exudate either in a thin layer or in many layers, and when the abdominal viscera is the region more generally involved, all of the viscera are agglutinated together. This condition ought readily to be discriminated from simple peritonitis, pleuritis or pericarditis, by involvement of the serous surfaces in other parts of the body and by the characteristic appearance of the lungs and skin. A diagnosis of hog cholera or swine plague should always mean condemnation of carcass and viscera.

Swine infested with *cysticercus cellulosae* are found occasionally. In the few cases I have seen, cysticerci were present in great number, pervading all the voluntary muscular structures and the heart. When found elsewhere the cysts were imperfectly developed. They appear as little sacks of water about one-fourth of an inch in diameter, lying upon and wedged between the muscular fibres. Each sack contains a white mass about the size of a millet seed (a tapeworm head) which projects inward from the cyst wall. Flesh containing these cysts is commonly denominated measly pork and is the source of tapeworm (*tania solum*) in man. Of course the flesh would be rendered harmless if thoroughly cooked, but would remain disgusting, and should be condemned.

The cystic form of the *echinococcus veterinorum* is very common in swine and the hydatids are found almost exclusively in the liver. While the authors have reported the finding of this cystic parasite in all parts of the body of both man and animals, medical and veterinary records do not show such a widespread diffusion in this section of country. The cysts vary in size from $\frac{1}{4}$ to 2 or 3 inches in diameter and consist of a translucent double wall enclosing its full capacity of transparent liquid. The inner wall (mother membrane) is easily separated from the outer wall, and if divided it persistently rolls upon itself when effort is made to spread it flat upon a surface. The inner surface of this wall or membrane usually bears many minute whitish bodies, only observable upon close examination. These bodies are made up of from 10 to 20 tapeworm heads, which are plainly visible upon 50 to 100 diameter magnification. The cyst and contents are modified by degenerate processes and may be converted into abscesses. They are found on the surface or embedded in the substance of the liver and vary in number from one to many. Infested organs should be rendered unusable as food for man and beast.

The report of the Department of Agriculture states that three and one-twentieth per cent. of all hogs examined microscopically

by the department during the fiscal year ending June 30, 1893, were infested with trichinae as the number examined exceeded one and one-half millions, it is evident that this parasite is widespread and very prevalent. Trichinae produces no gross lesions in the infested animal, and is detected only by aid of the microscope. They are found almost exclusively in the muscular structures, and are most numerous in the tongue, diaphragm and psoae muscles, but are confined to no section of the carcass. They are readily detected when magnified thirty to sixty diameters, and specimens of muscle either fresh or cured, are easily prepared for examination, either by mincing or cutting it into small pieces and spreading between glass slips thin enough to permit light to pass through. The trichinae are usually found coiled like spiral springs and are enclosed in sacks of transparent fluid, usually one in a cyst, but sometimes two or three and even five or six. The cyst and contents including the worm are subject to both fatty and calcareous degeneration, in the latter form of degeneration, the trichinae are often black and fragile, being frequently broken into fragments in the preparation for examination. Trichinized flesh does not differ from the non-infested flesh in appearance and is harmful as food only when eaten uncooked. The communities and nations which eat their pork raw naturally require the inspection and condemnation of trichinized pork.

This presentation in short review of the gross diagnostic lesions of diseases and conditions of food animals, and comments as to the disposition of the flesh is all too brief, but may serve to open the discussion. Diseases and conditions which have not come under the writer's personal observation, have been purposely omitted.

ACUTE INDIGESTION IN THE HORSE.

BY ROSCOE R. BELL, D.V.S., BROOKLYN, N. Y.

The title of this paper will remind every practicing veterinarian who hears it of a disease which causes him more sleepless nights than all the other diseases with which he comes in contact put together. It not only calls him from his bed when he is taking a much needed rest, but often prevents him from reaching his waiting couch for many hours. He knows, too, that upon his success in saving the lives of such patients his local reputation is made or undone; that their successful outcome means extended practice; that their fatal termination in succeeding instances means a contraction of patronage. In the vast majority of communities reputations are in direct ratio to the amount of success attending the veterinarian's efforts, and acute indigestion seems to be the crucial test of one's ability in the estimation of his patrons. It appears to me that there is much room in this disease for the display of judgment, and the exercise of that knowledge which one gains through physiology and pathology, coupled with keen observation and close study of the deranged function of digestion and the dangers of structural changes which threaten or are in operation.

I was somewhat amazed upon reading a paper on this subject last month to find that the author felt called upon to apologize to an association for bringing forward such a "threadbare" theme—such a common condition. To me that forms the very charm of the subject, the fact that it is a disease which we meet daily in practice is cause sufficient for us to give it our most earnest consideration, and the fact that nearly every writer differs in his treatment, if not his pathology, is reason enough why more study and investigation is urgently needed. One writer places all such patients under opiates, to relax the muscles of the intestines; another condemns in unmeasured terms such an unscientific procedure, claiming that the nerves are thus anaesthetized and peristalsis balked, the only means which we had of ridding the bowels of its fermenting contents. One relies abso-

lutely upon chloral hydrate for its relaxant and antiferment qualities, while another is sure its action is contraindicated. One prefers cannabis indica, another belladonna, one morphine, another invariably sees the indication for eserine or barium chloride, while the latest writer I have observed has obtained surprising results from pepsin. Certainly such divergent conception of the therapeutics of the condition means that the causes and processes of the deranged function are differently estimated, and conclusively proves that there is much that we do not understand.

In the cities, at least, it is one of the most frequent conditions that the veterinarian is called upon to treat, and I make the assertion that out of every one hundred cases of colic, ninety-nine of them are directly dependent upon indigestion. It is extremely seldom that I ever see pain produced in the horse's abdomen by simple spasm of the muscular coat of the intestines. Some writers have hinted at spasm being the origin of the indigestion—that is, that the deranged peristalsis produced by the contraction of the intestine by spasm is the cause of the indigestion; but I am convinced that the conditions are reversed; primary indigestion gives rise to spasmodic contractions, and later that is succeeded by the more serious symptoms observed in pronounced cases of acute indigestion. I speak of its prevalence especially in cities, because it is a much more frequent condition there than in the country, just as a chronic or subacute indigestion is more often seen in city men than in country men. Mode of life and labor are the starting factors, and the continued disobedience of the laws of digestion lead up to a state where life is endangered and medical aid becomes a necessity. The city work horse has little to choose from in his menu, and what he does receive is essentially fermentable, being oats from the beginning of January until the close of December, with just sufficient bran at long intervals to clear the conscience of the feeder. His work, often laborious and exhausting, occupies every hour of a long day, save just sufficient to masticate and swallow from four to eight quarts of pure, solid oats, and the labor is resumed. Just here, in my judgment, is to be found the most prolific cause of the trouble which is engaging our attention. When the horse is given his noon meal he is usually warm, or at least his system excited, his circulatory and nervous energy still upon his muscular apparatus, and the food is taken ravenously into a stomach that is totally unprepared to receive it. With the muscular and

nervous systems demanding or having exhausted the energy which should now be directed to the stomach, there certainly cannot be that quantity of healthy gastric juice essential for putting the food through the processes necessary to absorption and assimilation ; hence it lies in the stomach until the heat of the abdominal organs creates a natural fermentation, when gas forms in such a quantity as to distend the walls of the stomach, stretching the nerves and causing pain. The digestive apparatus of the horse is peculiarly constructed to favor such processes, and the veterinarian is more powerless in combatting this disease in him than in any other veterinary patient. The stomach is much smaller, in proportion to his size, than in any other animal ; but the intestines are very capacious, extremely vascular, and have intimate nervous connections with every other part of the system. These anatomical peculiarities insure the extraction of the maximum amount of nutriment from bulky and comparatively innutritious food, but render the subject peculiarly liable to indigestion. When distention has occurred to the extent of producing visible pain, stomach peristalsis ceases, and if even a small amount of digestion was in process, it now ceases entirely, and the horse's life is in danger in exact ratio to the degree of fermentation undergoing. In its efforts to escape from the narrow confines of the stomach the gas makes its way through the small intestines to the caecum, large colon, and thence towards the rectum. If the egress through the channel were without obstruction the mortality of the disease would be greatly diminished, but on account of the numerous convolutions of the small and the flexures and diverticuli of the large intestines, it accumulates in pockets or in sections and its backward progress is prevented by the pressure of the other portions of the intestines upon that containing the gas. Distention here again occurs, pain is intensified, and intestinal peristalsis ceases. Then we find our patient with a stomach full of fermenting ingesta, its walls paralyzed by distention, and the immense area of the digestive tract effectually blocked, while its walls are stretched to their utmost capacity. Will the fermentation cease before asphyxiation, rupture, inflammation, or exhaustion occurs? asks he who is striving to accomplish its subsidence, for surely the educated veterinarian can see no other indication than to cut short that process as quickly as he can, and to secure the release of the confined gas. If the soliped could vomit as readily as man or the dog, the indications would be different, but with the peculiarity of his

stomach he must suffer while the phenomena of fermentation continues. Occasionally relief is obtained by the eructation of gas through the oesophagus, and in most such cases it is due to the rupture of the spiral fibres at the cardiac opening. However, it is just so much gas gotten rid of, and it is thus to be welcomed.

I have only mentioned one condition that is likely to result in acute indigestion, but I am sure it is the most frequent cause. We know, however, that many other breaches of nature's laws will bring on the same result. For instance, if an animal, either excessively hungry or inordinately gluttonous, be fed more fermentable food than the stomach can accommodate; if he break from his attachment in the stall and find his way to the oat-bin, devouring more than the stomach can dispose of, there is but one termination and that is fermentation. If, while the stomach is physiologically congested, in preparation for or in anticipation of a waiting feed of oats, a full drink of cold water be taken, the walls are chilled, the blood-vessels contracted, the nervous function perverted, the secretion of gastric juice ceases. The appetite, however, may remain, and the stomach receives its complement when not in a state to digest it. Result, the same as when fed while having a heated stomach. If the water be taken when digestion is in progress, if in unmeasured quantity, or especially cold, the same effect may follow.

Thus far I have considered only those causes which may occasion the disease in otherwise healthy subjects, and I have purposely omitted to make mention of unwholesome food, because, although such may be a prolific cause, to embody a consideration of this aspect of the subject, would necessitate my far exceeding the time limit for the reading of this paper. Besides, I am more concerned in the therapeutics of this disease to-day than in its etiology. I may also wish to supplement my remarks by referring to its frequency in those subjects possessing weak digestion from anatomical, physiological or pathological peculiarities. Thus the horse with the washy build, weak digestion due to defective organs engaged in primary assimilation, or where chronic intestinal catarrh has invited the sojourn of worms, may be reckoned on as more prone to acute attacks. But we so frequently prescribe for a subject which has never occasioned any suspicion of such a condition in years of faithful service; and which, recovering from such an attack, may never again be so afflicted, that I prefer to treat of the disease in such a horse.

When I diverged from the processes going on in the stomach

and intestines when fermentation is undergoing to speak of the anatomy of the horse's digestive organs, I left my patient with stomach and bowels full of gas, the walls atonied, and gas still forming. The efforts of the attending veterinarian are directed towards producing a cessation of the gas-forming process and the liberation of that which has accumulated. If the gas has penetrated as far back as the caecum and large colon, I believe the first imperative duty of surgeon in a dangerous case is to puncture with the trocar and canula, and often the relaxant affect of such a procedure may be sufficient to start its exit by the rectum. At any rate, it has emptied the caecum and left a vacuum which can receive an equal amount from the anterior intestines. If detention again occurs, repuncturing will be productive of as good results in the second instance. If the caecum be not the seat of the accumulation, but the left side be dangerously tympanitic, I should not hesitate to enter the small intestines with the trocar, though regret may be felt at the necessity. After the first puncture, there will then be time for the administration of drugs; the urgent symptoms have been relieved. Antiferments, absorbents, and relaxants seem to be the only reasonable means of combatting the condition. The most popular drug in such a condition has been for years chloral hydrate, and in my estimation no new one has been discovered which is superior to it. Arguing from its action outside of the body, it assuredly possesses anti-ferment qualities to a high degree, as demonstrated in its capacity to preserve animal and vegetable tissues. Its effects upon the muscular coats of the digestive tract are as relaxant as possessed by any other drug within our knowledge, and it has no tendency to dry up secretions like opium. If the nerves of the intestines are anaesthetized, it is only temporary; its effects are purely nervous, and by the time the next process is ready to be undergone, the system has emerged from under its influence and peristalsis may be resumed, so far as chloral is concerned. Should the digestive tract be unable to rid itself of the gas with sufficient rapidity to relieve pain, or if the oesophagus and the intestines absolutely refuse to carry it off, the danger of rupture of the stomach becomes imminent and something must be done to relieve the tension. I have read with concern the suggestions of a few to puncture the gastric pouch, with a long trocar, entering the abdominal cavity just posterior to the xyphoid cartilage of the sternum, shutting the eyes and driving the trocar in the direction of the stomach, at the same time offering up a mute prayer that all other important organs will

escape your instrument and that you may land its point in a mass of fermenting ingesta in the stomach, where there can be little hope that you will deliver the canula in the free gas, which will undoubtedly be in the superior portion while the contents of the lower part will rapidly fill the canula and effectually prevent the escape of gas through it. It appears to me, therefore, that no practical results can be obtained by this procedure. Our efforts must be directed towards absorbing, decomposing, and neutralizing the gases contained in the stomach. Animal charcoal is in my judgment the most effective absorbent known to us, it being estimated that each atom is capable of absorbing 480 times its own volume ; but this high absorption power cannot be obtained except in its dry state and therein lies the secret of its administration. It has been my practice for years to introduce charcoal powder into the stomach dry, which is easily accomplished by using gelatin capsules. And I do not confine the dose to that laid down in the *materia medica*, but have frequently given a pound in this manner. I carry constantly with me a pound box containing a mixture composed of two-thirds charcoal and one-third bicarbonate of soda, and from this mixture are filled the capsules as they are required. This method was forcibly presented to me some years ago, when holding a post-mortem upon a horse dead of ruptured stomach. The last capsule given had just melted, and the drug contents were lying mixed with the mass that had been undergoing fermentation, ready to consume its proportion of the gas that cost the life of my subject.

In the majority of cases the horse's life will be spared until fermentation ceases, and then complications are extremely liable to arise out of the conditions that have been left as a consequence. The most frequent sequel in my experience is *Impaction of the Intestines*. Peristalsis having entirely ceased, the mass remaining after fermentation passes backward with difficulty, and that which has occupied the intestines is apt to become dry, hard, and adherent to the mucous membrane. The moisture has evaporated in consequence of the general congestion of the bowels, and remaining at one point so long in consequence of the absence of the worm like motion of the bowels it is apt to become fastened to the membrane. I have never considered that the establishment of violent peristalsis in such a state in keeping with our knowledge of the diseased processes, but that it was extremely apt to produce enteritis, superpurgation, or rupture of the intestines. Generous doses of linseed oil to lubricate the intestinal

tract, to enter and soften the faecal concretions, to augment the fluidity of the contents and gently stimulate the motions of the intestines, supplemented by the frequent administration of such sympathetic nerve stimulants as belladonna and nux vomica, as well as rectal injections of warm soap-suds or oil. If by physical examination of our subject when fermentation has ceased, we are certain that peristalsis is not in operation, begin at once in a systematic manner to accomplish its re-establishment and the evacuation of the bowel contents. A quart of linseed oil at first, and another at the next visit, and then lighter doses until evacuation occurs. It is surprising the amount of oil that is often required. A patient who suffered from impaction after a rather severe attack of indigestion, refused to respond to our efforts for nine days, and in the first passage oil was thoroughly incorporated, showing that it was necessary to permeate the entire mass before it would move. In the time mentioned, he had received 3 gallons of oil, and his faeces did not become softer than that usually voided by cattle. All through the faeces could be found shreds of mucous membrane. It is always my instructions to my assistants to administer before leaving patient with this disease a quart of linseed oil, and unless the case be exceptionally severe, it will be sufficient to prevent impaction. My instructions on the label of colic drenches left with my customers, is to administer in a pint of oil, and I feel that this precaution is a valuable one. Many practitioners whose opinions I greatly respect, are strong advocates of eserine and some barium chloride in acute indigestion, administering it at almost any stage and even intravenously; they claim the utmost wealth of good results; but I have found such drastic measures in the majority of cases too severe, and prefer the method advocated.

DISCUSSION.

DR. WHITBECK: I think this paper interests a great many of us country practitioners especially. As Dr. Bell has stated, a large share of our practice is made up of such work. There are a great many cases that many of us do not like to take hold of. My views are very similar to his in the use of eserine. In a case of violent fermentation, as I stated to this Association a few years ago in Des Moines, I think it was, instead of administering cathartics, oil, aloes and medicines of that kind, I very much

prefer in my practice, and have better results from an aloetic ball per rectum. It should be inserted as far as the arm can reach, after cleaning the bowel thoroughly, and consists of five or six drachms of aloes, mixed with turpentine, and hardened into a ball. I would recommend that very highly. I have had excellent results from it. There is no way of administering cathartics so easily and so beneficially, as demonstrated in my practice, as in the use of this aloetic ball. I have not had to wait several days, as Dr. Bell states, but, as a general rule, by the use of this aloetic ball in six or eight hours at the outside, and many times from three to four hours, I have had beneficial results. I do not believe in the use of eserine for the simple reason I have used it thirty or forty times and never had any action from it. Some of the members of this Association can use eserine and get returns every time, and they must, in my opinion, possess some magical power over it. I cannot produce any action from eserine and have stopped using it. In regard to the stopping of fermentation, I have found that the administration of a little aconite will answer. I have administered it in doses of a teaspoonful and a half, and I have found that the fermentation stopped immediately.

DR. WILLIAMS: I regard the paper as one of special interest, and there are some phases of the subject which I think should receive very earnest consideration. There is one thing which we seldom take into account, and that is the anatomical condition, which makes it possible for this severe distension to take place. In indigestion of the horse we have tympany of the large intestines, and it is the only one of the domestic animals in which we find either gastric or intestinal tympany to any degree. You can find rare cases, it is true. It seems to me we have an anatomical demonstration of this in the form, size and disposition of the large intestines. It is very large and filled with hard food, and is so arranged that any great pressure on any one part of the colon will close the loop of the intestines and prevent the escape of the gas. As a result of that we find gastric tympany, or it may precede caecal tympany. If we prevent caecal distension, we at the same time prevent extreme gastric distension, as the gas passes readily back as a rule to the caecum and lodges there and in the colon, causing indirectly great distension of the stomach. In my practice, I will say there is practically no danger from rupture of the stomach so long as there is not extreme distension of the caecum. In other words, if the trocar is used at a sufficiently early

stage often to permit the caecum to relieve itself of the accumulated gas, the stomach is relieved. Some ask how it is that the stomach is ruptured instead of the caecum. I claim it is due to a simple law of physics that a gas presses in every direction with equal force, and that the stomach being the most conspicuous dilatation in the alimentary canal has to undergo greater total pressure on account of its superficial area than any other part of the tract, and is consequently the first part to give way. In regard to purgatives, it is a point upon which we will perhaps always disagree. We will try to arrive at the same results and only take different rules for attaining the same ends. The pathology is not always so well known as we might wish. In general we may conclude that the first pathological condition we have is fermentation of food, then paralysis of the alimentary canal in part from distension and in part from intoxication,—coma of the animal from poison generated in the alimentary canal. How shall we relieve them? We will always differ. Some say by the removal of the food from the alimentary canal. That has its danger, as was pointed out, and it certainly is a practice that is generally unnecessary, although we must admit that in some cases it is beneficial. Another plan is with stimulants, and we have a great variety of those. By the use of stimulants we arouse a healthy peristaltic action, and when we have done this we stop the action of ptomaines from the decomposition of food, and the food passes along in the alimentary canal in the ordinary usual way, the animal being neither purged nor is the movement of the bowels stopped, and that method is successful. Others like to give strychnia. There we have a stimulant, something to arouse peristalsis. When we have normal peristalsis ptomaine formation ceases.

Another method of producing the same result is the use of one or more remedies which a great many people discard but to which others adhere very closely. One of these, from which I have seen most excellent results is eserine, used, not as a purgative, but as a stimulant in a dose that will simply arouse the normal peristalsis of the bowels; perhaps a quarter of a grain, or something like that. Another plan which has been proposed in the paper is that of antiseptics or remedies which will absorb or destroy the products of fermentation.

From this it will be seen that we have a great variety of remedies and I believe that success depends upon the method of using them rather than upon the remedies themselves,—a man may be successful with either of them.

Then there is the other idea of going still further with a paralyzed bowel, and giving such a drug as opium, which seems to me is clearly out of order, because its introduction increases the paralysis and does not increase the opportunity for the escape of gas.

DR. MERRILAT: I wish to say a few words in behalf of the much condemned drug, eserine, and to contradict, if you will kindly permit me, the statement of Dr. Williams as to the stimulating action of eserine. I have been unable, in my study of medicine, to understand how a drug can be a depressor of the motor columns of the spinal cord and still be called a stimulant. Now, I would like some one of this august body to describe the phenomenon which follows the administration of the drug eserine which depresses the motor columns and still stimulates the muscular walls of the bowels. From the experiments which I have made together with our professor of physiology, we have come to the conclusion that eserine is not a muscular stimulant in any sense of the term. We have seen that eserine only acts in those cases in which there is peristalsis already present. Like the horse that is attempting to run away and you throw the lines out, when the bowels are attempting to run away eserine cuts off the lines and away they go. That is the deduction we have made after considerable experiments, an extensive series of experiments with eserine, and in view of the fact that it is a depressant, it is a very reasonable deduction. Along side the experiment which, of course, everybody knows in making experiments it is very much easier to talk about them and to write about them than to make deductions on them, but we have come to this conclusion, and I would like to have Dr. Williams' views on the matter, whether he really believes eserine will go to one substance and depress it and then go to the ganglion in the bowels and stimulate them, and I would ask him to tell me how a drug can do such a thing, how alcohol can stimulate the brain or rather depress it, in one instance, and go to another nerve center and stimulate that nerve function. I know that there are eminent men, such men as Dr. H. C. Wood and the other Jefferson College man, who give us as their opinion and have made deductions from experiments which of course we must respect, stating that eserine is an absolute stimulant to muscles, but I believe that our experiments are more conclusive and are more to be considered in that the effect is due to the depression of the inhibitory nerve force rather than a stimulant of active nerve force.

DR. WILLIAMS: I was not attempting to be exceedingly

exact according to the standpoint Dr. Merrilat has taken. I was looking at it from rather a practical standpoint in regard to the use of eserine, and that is that when a moderate dose of the drug is given to an animal in which there is intestinal paralysis, whether that paralysis be central or peripheral, whether it be due to distension of the bowel from gases, or from the action of ptomaines, that the introduction of a moderate dose of eserine subcutaneously or intravenously, when there is well marked paralysis in the intestines, in the entire alimentary canal, it will stimulate the intestines, and that was the basis I had in my mind when I said the drug was a stimulant. I did not go into the question which Dr. Merrilat has raised.

DR. MERRILAT: I want to say that our experience with eserine is that it is an absolute purgative in properly selected cases. In the case described, where the bowels have no peristalsis, where it is due to some other cause, that eserine will not act; but where there is already well marked peristalsis, when the animal has already had a passage that it will act. In this last case you may depend upon eserine producing action.

DR. NIGHBERT: I fully sanction the entire treatment of Dr. Bell. His is along the line of my treatment, as to the action of eserine. I was very glad to hear Dr. Merrilat's explanation. I have seen cases where there was no action at all, but the proper time is when there is action of the bowels you get very nice results that way. The charcoal treatment is one of the best things I have been able to get but I have not used it in the dry powder, and I get very good results.

DR. CARY: Just a point or two I would like to have brought out. There was mention made of peristaltic action, or rather that peristaltic action has a given effect on things of that kind. There are in some cases quite difficult conditions to diagnose before the death of the animal, and they are the cases that bother me, and here is the point that I would like to have brought out, and that is you have at times volvulus of the double colon, as I had in one instance where it had almost two or three turns, as I found out afterwards,—I didn't know it then. I had tapped the colon some two or three or four times and removed the gas and gave relief, and I knew there was something wrong there that was serious, but how to get at the exact facts by investigation was a question I could not answer. Can any one throw light on this subject and give us an opportunity to make a proper diagnosis of these things?

There is another point. There is quite a question in the

minds of a good many as to whether rupture in the stomach is ante-mortem or post-mortem.

DR. NELSON : In regard to Dr. Cary's question. I can limit it down to fifteen minutes for you, or a little less. When I was through with a post-mortem it was fifteen minutes after the animal had died, and I found in this case, one of quite acute indigestion, that after the characteristic quiver of the muscles of the elbow, the animal suddenly fell down and died. Just at this point it was immediately opened for post-mortem, and I found a tear in the stomach which to me looked apparently fresh at that time, of about three and a half inches. It was situated upon the left face of the stomach.

There is another thing that I would like to suggest. In the far west we raise feed for our horses that is composed two-thirds of wheat and one-third oats. It is cut just before it is ripe and put in a bundle, and this bundle will weigh from 11 to 14 pounds; three of them are fed per day, and sometimes four, to heavy horses; this will make all the way from 40 to 55 pounds for an animal to eat. In case of indigestion, where there would be intense distension of the stomach, where I could perceive no benefit from my drugs, in those instances I have had fair success by using the speculum and passing a probang down and allowing the gas to escape through it, and then continuing my therapeutic treatment.

DR. BELL : I am perfectly willing to trade my paper for any of the remarks of the gentlemen who have discussed it because I accomplished what I tried to do, gave a few cases of indigestion and our treatment, and the discussion has brought out some points which I think puts this Association under some obligation to me for preparing this paper. I objected to the use of eserine very largely upon the theory that I could not understand exactly—I was convinced from the use of eserine that it was a nerve depresser, and I labored with the question as to how it could be at the same time a nerve stimulant, and I think the Association is under considerable obligation to Dr. Merrilat for his experiments and the explanation he makes of its use. My friend, the President elect of this Association, told me on our trip west that he did not hesitate to give two grains of salicylate of eserine in the jugular vein in any stage of acute indigestion. I put the question to him, "Would you administer such a dose when the stomach was violently distended, where we fear that it would be ruptured?" He says, "Certainly, I would." I have forgotten his statistics, but I think his cases were sixty with the loss of one." How we could use

such dangerous drugs as eserine was apparently with such immunity from law suits and jails was a thing that made me exclude it, and I feel entirely compensated for any time I may have lost, not only in preparing the paper, but in making the trip half way across the continent, for the explanation I have received.

DR. CLEMENT : I will say in explanation of Dr. Bell's remark, that I never said two grains of eserine intravenously. I said I had given two grains of eserine hypodermically and one grain intravenously.

A MEMBER : I would like to ask Dr. Bell a question. I came from the corn country, pretty much down on the Kentucky border. I see he uses bicarbonate of soda with charcoal. I have had a good deal of success with bicarbonate of soda, except that it is pretty hard to tell when to use it. Occasionally it will cause you a great deal of trouble. It will stop fermentation in some cases, and in other cases it will cause you a great deal of trouble.

DR. BELL : I will say that I have used bicarbonate of soda indiscriminately and never have fancied any ill results from it, and I should not hesitate to give four or five ounces of it at any stage of the disease, and I would not expect to get any ill results if I got no good ones.

DR. WALROD : I am fully in sympathy with the way Dr. Bell treats his patients because I have had a case where it lasted five days and six nights with that trouble and put down oil and flax seed tea by injection from the mouth, and saved it.

With regard to using soda. I think sometimes it forms a gas and you get bad results from it.

DR. BAKER : Dr. Bell said, in his paper, that he gave a bolus of charcoal and bicarbonate of soda, and in the autopsy he found it dry and not dissolved. It was there and had not yet been absorbed, proving don't you see, that the horse died very soon after giving the dose. What does opium do? It locks up the bowels, or has that tendency, it paralyzes peristalsis. It has no curative tendency whatever. It dulls sensibility, and it will come pretty near insuring the death of the patient if it is at all a bad case. It has no curative action, in this way and for this reason ; it does not have a tendency to remove the gas in all cases, consequently I think opium in any form, with the possible exception of morphine in a moderate case, is absolutely useless. I speak particularly with reference to laudanum, which is frequently used in connection with colic, and I regret that the old

schools have not discarded the use of opium as a cure for colic. I think it kills more horses than it saves.

There is one other point in Dr. Bell's report that I can hardly agree with, and which strikes me very forcibly. He seems to recognize the attachment of the fecal matter to the wall of the bowel. I disagree with him for this reason : that instead of attaching themselves to the wall of the bowel, they lie there inert on account of the inability of the bowel to propel them. It is a fundamental principle that the moment that peristalsis of the bowel is arrested irritation begins, for the simple reason that the fecal matter, lying inert in any one place any length of time, will act as an irritant to that spot, and leads to the inflammation that finally kills the animal. I think that anything that will move that along is curative, and things that will not move that along are utterly incurative.

DR. BELL : I can admire the theory of Dr. Baker, but I am sure that the attachment to the bowel of the fecal masses does occur because I have seen it. I unhappily have not been able to save 59 cases out of 60, therefore I have held a post-mortem on my cases. I have frequently seen and withdrawn those masses from the mucous membrane with difficulty, and sometimes took a pile of mucous membrane with it. I am not prepared to go into the chemistry of the action of bicarbonate of soda, but when the acid conditions are excessive we are taught that alkalies neutralize them, and that is the theory upon which I advise the use of bicarbonate of soda. The question of the charcoal, which Dr. Baker spoke of as being the cause of death because it had not been absorbed was explained in the paper, that the capsule had just been absorbed and liberated the charcoal powder, and the charcoal had not performed its function of the absorption of the gas, but I said it was there to do it. I know that a great many practitioners are in the habit of giving charcoal in solution or made into a bolus where moisture was employed. It was my idea that moisture with it destroyed its absorbent powers and therefore I advised and will continue to use it in the dry state.

DR. LYFORD : I wish to discuss a little further the bicarbonate of soda. I have discarded it years ago because I thought I had ill results from it, and no doubt it will occasionally get you in a great deal of trouble. I have recently, and for a number of years, used in its stead salicylate of soda, and it is possible that somebody may have found trouble with that, but I had much better results with it than I had with the bicarbonate.

The question of the rupture of the stomach was interesting to me. Our friend from the west speaks of having post-mortemed a case under very similar circumstances to one of my own. I was called at twelve o'clock,—at half-past eleven the horse got his feed, and the man had driven home in a hurry as he claimed, and only lived seven blocks from my office ; they wanted a hot mash, and the people were making yeast and had plenty of potato mash, and they took the hot water, potatoes and all and put in a bran mash and gave it to the horse. I was at the house at 12 and the horse had one of the worst cases of flatulence of the stomach that I ever saw. He was dropping on the floor and rolling around and corn, potatoes, bran and all was coming from his nose and mouth, still he hadn't eat all his food. The horse did not live to get much treatment from me. I will say that we had a post-mortem on the horse before one o'clock, and the horse's stomach was ruptured, and if I remember it was 11 to 14 inches. I felt quite certain in this case that the stomach was ruptured before death. There were no signs of inflammation or anything of that sort, and I felt quite certain that it was the gas that made the stomach rupture, and that the stomach may be ruptured long before the horse is dead.

I was quite interested also in the cases that he spoke of where the trocar may be used. One case in particular that I was called to see—it also mingles with another case where the gentleman behind me spoke of using aconite. I had always supposed that I had cured the horse, but I now think that a quack cured it. He had given three ounces of aconite, and I was called to see what I could do. The horse was being led to my stable when I met him about a half a mile from my office and the man did not know whether he could get him in my stable or not. The worst trouble with the man was that he thought the horse had swallowed the neck of an empty bottle. He had tried to give him three ounces of aconite, and as he got probably one-half or two-thirds of it down, the horse in the struggle, bit the top of the bottle off and swallowed the ring and a sharp point. I got the horse into my stable as soon as I could, and before I could administer anything I had to pass the probang push down, and I have no doubt that he was correct, because I felt the hard ring. I passed that in, and when I did, of course a good deal of gas escaped from the stomach, and I then gave the horse tannic acid and in a few days he recovered. I see now it was in spite of my treatment.

DR. ALLEN : I am sorry that Dr. Williams did not add to his eserine a little bit of aloes and atropia and a little bit larger dose of strychnia. I do think that eserine has a legitimate place in our medicine chests. I do think it is a good drug when wisely used in large or small doses, or not used at all in some cases. I think it is a very much better drug in a great many cases when it is combined with a very minute part of atropia or a little bit larger dose of strychnia.

DR. VINCENT : I would like to ask these gentlemen what is the objection to introducing medicines into the large colon in case of impaction to assist the colon in evacuating its contents. I have done that with good results.

DR. BELL : I have no objection to it. The treatment in the paper was simply that which, to my mind, had given me the best results. I have frequently known of the method of the trocar, and some advocate it and adopt it, but I do not because I prefer the other.

On motion, the further discussion of this topic was discontinued.

STATE CONTROL OF HOG CHOLERA.

BY DR. M. H. REYNOLDS.

It has been a rather generally accepted belief among state authorities who are working with infectious diseases of animals, that hog cholera was just hog cholera, a sort of hopeless job anyhow, and that there was no use of attempting anything in the way of state control. I wish to insist that such lethargy is not justifiable and that state authorities who are not making an organized and aggressive fight against hog cholera are not doing their full duty. It is a common excuse that, "we have no such laws back of us as you have in Minnesota." The simple remedy of such difficulty is to get such laws. I am fully aware that the hog cholera problem is a large one. I am also aware from personal experience in a long struggle that it is a difficult one ; but I still insist that it is both possible and practical under favorable conditions to quarantine hog cholera.

My discussion of this problem must necessarily be largely of

Minnesota methods, for so far as I know Minnesota is the first state that has made any definite, organized attempt to control extensive outbreaks of this disease.

We have a State Board of Health consisting of eight physicians and one veterinarian, as a central body, and 1,841 local health officers and local boards of health. Boards of township supervisors are *ex officio* local boards of health in the country. Our State Board of Health, so called, together with every local health officer in the state constitutes the real State Board of Health. This makes an immense but fairly organized machine.

Our work in the State Board of Health is divided into three departments: Secretary and general executive officer, bacteriological laboratory and director, and veterinary departments and director. The fund appropriated for work with infectious diseases of animals pays a portion of the bacteriological laboratory expenses and is entitled to whatever work in that line it may need. We have two first class bacteriologists and a number of assistants at work in a finely equipped laboratory.

As a rule reports of infectious diseases of animals come first to the local health officer of some town, or the chairman of township supervisors in the country, and our law provides that this local health officer shall report the same to the State Board of Health, within twenty-four hours. Local authorities are expected to take immediate charge of outbreaks of infectious diseases, under the direction of the Veterinary Department of the State Board. Local authorities employ their own veterinarian and pay their own bills, but the State Board of Health has rules which have been issued for their guidance and the work for each outbreak is supervised by the director of the Veterinary Department, either by correspondence or by the assistance of a field veterinarian.

We are quite proud of our new Minnesota law dealing with infectious diseases of domestic animals and in order that I may make plain our methods of dealing with the hog cholera problem it will be necessary to give some extracts from this law:

SECTION 1. Authority is hereby given to the state board of health and to the several local boards of health of the towns, villages and cities of this state, to take all steps they may severally deem necessary to control, suppress, and eradicate any and all contagious and infectious diseases among any of the domestic animals in this state, and to that end, said boards are hereby

severally empowered, within their respective jurisdictions, to quarantine any domestic animal which is infected with any such disease or which has been exposed to infection therefrom ; to kill any animal so infected, and whenever deemed necessary by the state board of health, to kill any animal which has been exposed to the infection of any such disease.

* * * * *

Said state board of health is hereby expressly given authority to regulate or prohibit the shipment into this state of any domestic animal which, in the judgment of said board, may endanger the public health.

§ 2. Any person who knows of, or has reason to suspect, the existence of any contagious or infectious disease in any domestic animal, shall forthwith give notice thereof to the local board of health of the town, village or city, where such animal is kept. Within twenty-four (24) hours after any local board of health shall receive notice that any domestic animal is infected with any such disease, or has been exposed thereto, it shall give notice thereof in writing to the state board of health.

* * * * *

§ 4. No animal shall be killed by any of the boards herein mentioned until it shall first have been adjudged to be infected with a contagious or infectious disease, either by a duly authorized agent of the state board of health, or by a physician or veterinary surgeon selected by a local board of health ; except, that whenever, in the judgment of the state board of health, the control or eradication of a disease renders it advisable to do so, such board may order killed and buried, or otherwise destroyed, any domestic animal which has been exposed to a contagious or infectious disease, although at the time not infected therewith.

* * * * *

§ 7. It is hereby made the duty of the several local boards of health in this state to carry out and enforce all orders and directions of the state board of health to them directed, and the state board of health may require any two or more local boards to act together for the purpose of enforcing any of the provisions of this act.

* * * * *

§ 8. The state board of health, or any duly authorized agent thereof, may examine or cause to be examined under oath, all persons believed to possess knowledge of material facts concerning the existence or dissemination, or danger of dissemina-

tion, of disease among domestic animals ; and, for this purpose, shall have all the powers vested in justices of the peace to take depositions and to compel witnesses to attend and testify.

§ 9. Any person violating any provision of this act or any rule or regulation made by the State Board of Health, or by any local Board of Health, or any order made by any such board under the authority hereof, shall be guilty of a misdemeanor and be punished by a fine of not less than twenty-five (25) or more than one hundred (100) dollars, or by imprisonment for not less than thirty (30) or more than ninety (90) days. Any member of any local Board of Health who shall neglect or refuse to carry into effect the provisions of this act, or who shall neglect or refuse to carry out any directions of the State Board of Health, or who shall neglect or refuse to enforce any rule or regulation made by the State Board of Health, or by any local Board of Health, under the authority hereof, shall be guilty of a misdemeanor and be punished by a fine of not less than twenty-five (25) and not more than one hundred (100) dollars ; and each and every day's neglect or refusal to perform any duty imposed upon him by this act shall constitute a separate and independent misdemeanor.

* * * * *

§ 11. Whenever during the prevalence in the state of any contagious or infectious disease among domestic animals the owner shall post on his premises a notice forbidding all persons not authorized by State or Local Boards of Health to enter any building or enclosure on said premises with permission from said owner, it shall be a misdemeanor to enter upon said premises, punishable by a fine of not less than twenty-five (25) dollars, nor more than one hundred (100) dollars, or by imprisonment for not less than thirty (30) nor more than ninety (90) days.

CHAPTER 47—H. F. NO. 358.

An Act Relating to the Spread of Disease among Swine.

Be it Enacted by the Legislature of the State of Minnesota :

SECTION 1. It shall be the duty of the owner, or of any other person having in charge any swine that have died of any disease, immediately upon the fact of such death by disease coming to his knowledge, to bury the same at least three (3) feet below the surface of the ground, or burn the same so that the car-

cass is consumed. No person shall sell, give away or offer for sale any swine that have died of any disease, or have been killed on account of any disease. No person shall convey upon or along any public highway, or other public ground, or any private land, except his own, any diseased swine, or swine that have died of or have been slaughtered on account of any disease. It shall be unlawful for any person negligently or willfully to allow his hogs or those under his control afflicted with any disease to escape his control or run at large.

§ 2. Any person convicted of a violation of this act shall be fined in any sum not less than ten (10) nor more than one hundred (100) dollars, or by imprisonment in the county jail not to exceed thirty (30) days.

§ 3. This act shall take effect and be in force from and after its passage.

Approved March 12, 1897.

I would call your attention to the fact that definite and full authority is given to local and state boards. This law makes it the duty of any person who knows or has reason to suspect the existence of any infectious disease among any domestic animals, to report the same immediately to the local board and provides penalties for disobedience. The State Board has authority to order the killing and disposal of the carcass of any domestic animal which has been exposed to an infectious disease, although not at that time diseased. The State Board of Health, or any duly authorized agent, may examine or cause to be examined under oath any person believed to possess knowledge of material facts concerning an infectious disease among domestic animals. This law gives owners authority to post a notice according to section 11, which notice amounts to private quarantine in self-defense against careless neighbors. The carcasses of swine that have died of any disease must be burned or buried as prescribed. It is unlawful to sell, offer for sale, or give away carcasses of swine that have died from any disease, or have been killed on account of any disease. It is unlawful for any person to convey the carcasses of swine that have died of any disease or been killed on account of any disease, along any public highway or any private land, except his own. It is unlawful for owners to negligently or wilfully permit hogs suffering from any disease to escape control and run at large. And lastly, the fines that are imposed by this law are

such that suit may be brought in a justice court and are so moderate that judges, justices and juries will be willing to impose them.

Hog Cholera Campaign of 1897.—Please bear in mind that this work did not begin until the summer of '97 and at that time we probably had 41 counties more or less infected with hog cholera and a large mass of farmers and local health officers to deal with, who were intelligent but who knew very little of hog cholera and as a rule were indifferent to proposed methods of control.

Obviously the proper treatment for this case was to stir up and give the most information to the largest number of people in the shortest time. Considerable time and energy and a portion of our annual appropriation for 1897 were therefore devoted to this end. Local papers of the infected district were furnished a great deal of hog cholera literature and the editors kindly published it. About 500 papers in this district have been patiently helping us scatter information concerning hog cholera. I sent return postal cards to township chairmen in nearly 40 counties, partly for the purpose of getting needed information and partly for the purpose of stirring them up and getting them interested in the work. The newspapers have printed copies of our new report blanks, hog cholera card, notice card, hog cholera circular, etc. We distributed copies of the law and hog cholera circular, giving information concerning the disease, freely throughout the infected territory. This circular deals with symptoms, causes of disease, how the disease is scattered, what to do when an outbreak occurs, mistakes made by farmers, etc.

Hog cholera was discussed at a large number of farmers' institutes and other farmers' meetings all over the southern portion of the state.

It has been our aim to get this work in such shape that we might deal with hog cholera as the sanitarium in the field of human medicine deals with small-pox ; i. e., by intelligent prevention, or individual and carefully prescribed quarantine if the disease has appeared. In order to fairly estimate the results of this first campaign we must divide the state into two districts : (1) previously and badly infected district, and (2) territory infected for the first time during '97. In the former district, which included 15 counties, our results were far from ideal, although the maps and records indicate that we have been able among other things to render the spread of disease less rapid. This is also true of the territory immediately bordering on the

generally infected district. In territory infected for the first time during '97 our results were much more satisfactory. In many cases the disease did not spread beyond the township in which it first appeared. Our records indicate that there were 40 townships infected at some time between Jan. 1 and Nov. 1, and in which the disease had disappeared before the latter date. Total number of counties infected during '96, probably 41. Total number in which the disease appeared during 1897, 39.

That it is possible and practical to maintain successful individual farm quarantine against hog cholera was demonstrated over and over again during our imperfect work of '97. The two following letters illustrate this point :

COUNTY OF HENNEPIN, }
TOWNSHIP OF GREENWOOD. }

"Sanitary rules and regulations for the town were adopted on the 13th of April to go into effect the 1st of May.

On or about the first day of December, the State Board of Health called our attention to the fact of a communication to its office that hog cholera existed in our town, and for us to quarantine. Upon investigation it was found that an extremely fatal and apparently contagious disease had broken out among the hogs on twelve farms since last September ; mostly in the northwestern part of the town, resulting in the loss of 241 hogs, and since quarantine, thirty-seven, making in all 278 hogs. At a conservative estimate we deem that our people have lost between nine and ten hundred dollars by this disease. Quarantine was established by this board on the 4th of December, '97, against the further spread of suspected hog cholera, to continue in force until disinfection was made. In connection therewith an order was issued prohibiting the slaughter of hogs for either domestic use or transportation from the township unless first inspected by some member of the town board. The number of hogs inspected by the members was 136.

At present, as far as we know, this contagion has ceased within the original bounds of quarantine, (*no spread beyond quarantine limits.*)

The expense incurred to the town for the control of hog cholera will approximate \$22.

We are of the candid opinion that if our people would promptly report to the board of health, the first appearance of any dangerous contagion, before it gains an extensive foothold, it would be easier to check the ravages of such sickness and would surely add to the general comfort and welfare of our townspeople."

E. S., C. B. S.

The following letter from Chas. Kenning, secretary of the Minnesota Swine Breeders Association, illustrates again results that may be accomplished under reasonably favorable conditions by promptly quarantining outbreaks of hog cholera.

OSCEOLA, MARCH 1, 1898.

DEAR SIR : In reply to yours of the 18th inst., I would say that quarantine was established in Osceola Township, Renville County, on September 29, at which time four farms were quarantined, but it was learned later that at least eight farms were infected at that time. This covered the eastern portion of the township, mostly settled by a class of people with whom it is difficult to deal in work of this kind. During the next two weeks this disease spread some in this neighborhood, as these farmers would visit back and forth and help one another without proper precaution. The remainder of the town insisted that these farmers in this infected district should keep at a safe distance, and they avoided the infected farms as much as possible. *There was not a case of hog cholera outside the quarantined area*, and even in the infected district those that would not come in contact in any way with the infected farms also escaped. Although the local board did very well in this infected township, there were some things left undone. The loss would probably have been much less, if the farmers who insisted on doing as they pleased, had been severely dealt with according to law. I am satisfied from our recent experience that much can be done by proper quarantine ; but the people themselves must do their part, and if they refuse all necessary force should be used to make them. In all seventeen farms were quarantined in this township."

In estimating our results for 1897 it should be considered that the methods then in use did not have a fair trial. The disease had extended over 40 or 41 counties when this work began. We had a lot of local health officers to deal with who knew very little about hog cholera and very little concerning their duties in connection with it.

PRESENT METHODS—1898.

We have continued the general plan of individual farm quarantine and are trying to make it clear to farmers and stockmen that we quarantine only the hogs, hog pens, yards, etc.—not the entire farm as many of our people seemed to think last year. We are trying to get in as close touch as possible with the stockmen and railroad men of the state, for very obvious reasons. We need their support and help.

Whenever any suspicious disease appears on any farm, the township supervisors are expected to place all hogs, hog pens, yards, etc. where hogs have been recently confined, under rigid quarantine. This quarantine must include all hogs that have been exposed directly or indirectly with those that are sick. Conditions of quarantine are specified on the quarantine card, and read as follows :

"All persons excepting the owner, duly authorized attendants or medical advisers are forbidden to enter any enclosures where hogs are kept on these premises, until this card has been removed by permission from the State or Local Board of Health.

"Hogs must not be removed from these premises after date of this card, until six months after the last case has died or recovered, except in the following cases: 1st, by permission in writing given by the State Board of Health; and 2nd, dressed carcasses of healthy hogs killed under inspection of the State or Local Board of Health.

"No hogs, excepting those hereby quarantined and their off-spring, shall be allowed upon these premises until six months after the last hog has died or recovered. During this period of six months no other domestic animal shall be permitted in these premises for any reason whatever.

"Parties living on this place must not go near pens or yards where hogs are kept on other farms.

"Keepers of these hogs will be held responsible for the unauthorized removal of this card and for allowing any swine hereby quarantined to escape from these pens or yards and run at large."

Township supervisors are also expected to warn neighboring farmers of the presence of the disease, and give such other information as they may need. When the supervisors are in doubt as to the nature of the disease it is their duty to call a competent veterinarian to make necessary examinations and to ascertain whether the disease is hog cholera. The "Hog Cholera" card is posted in conspicuous places about the pens and yards.

The general plan of an educational campaign has been continued, but in a somewhat different way. Printed matter is still distributed freely and we are doing a lot of personal work with local health officers. We now have two field veterinarians, one of whom devotes his entire time to work with hog cholera, and the other gives a portion of his time to it.

Dr. Annand's field work is probably somewhat unique. Early in the season he began a campaign of personal work among township supervisors, the plan being to visit the chairmen of boards of township supervisors, and talk hog cholera with them; for instance, he takes dinner with one chairman, stays over night with the next one, and gives as much information as possible concerning the nature of the disease, how it usually spreads, duties of local health officers, and gives specific

instructions as to just what should be done in case hog cholera appears in that township. He is doing this work in what we call the border counties ; i. e., just north of our generally infected district. Beginning in the eastern part of Wright county he visited every township in a strip of country two townships wide across the southern portion of that county ; all the townships in Meeker county, excepting the four northern ones, and a strip of territory four townships wide across the southern portion of Kandiyohi county. In a similar way the eastern, southern and western portions of Stearns county were visited. The townships to be visited are selected according to location of infection last year ; and in a similar way he will work through Chippewa, Swift and Lac qui Parle counties. Dr. Annand is able to visit about two townships per day. He travels mainly by bicycle and his expenses are reduced to a minimum, averaging thus far about \$11 per week, much less than we estimated before the work began. I believe this work one of the best things so far attempted. I do not suppose that all the chairmen of town boards in this territory will do ideal work if the disease comes their way ; but I do believe that they will know enough about it to take prompt action and at least report the first outbreak so that they can be given specific instructions for further work. During our first season's work many of our local health officers seemed to think an outbreak covering less than half a dozen farms was not worth while reporting.

Our stock letters, as we call them, are printed in copying ink and in a color and style similar to the typewriter. These letters copy nicely in letter books. Each case usually calls for special comment or instruction, and space is left at the top for the address and this instruction in addition to the stock letter, which fits all of these cases. We save an immense amount of office work in this way. We have a letter of this kind for glanders, another for hog cholera and will soon have one for tuberculosis.

Our hog cholera stock letter reads as follows :

MINNESOTA STATE BOARD OF HEALTH.

DR. H. M. BRACKEN,

Secretary and Executive Officer, St. Paul, Minn.

DR. M. H. REYNOLDS,
Director of the Veterinary Dept.
State Board of Health.
St. Anthony Park, Minn.

DR. F. F. WESBROOK,
Director Bacteriological Lab.
State Board of Health.
Minneapolis, Minn.

It is the duty of local health officers, including township supervisors, to quarantine all yards and pens in which there has recently been any suspicious

swine disease. Conditions of quarantine are given on the "Hog Cholera" and "Suspicious Swine Disease" card, sent you under separate cover.

I send you to-day a complete hog cholera file, containing several copies of the Blank for Reporting Infectious Diseases among Domestic Animals. Please fill out one of these for each farm whereon the disease has appeared and return to me as soon as possible. It is your duty to put up in a conspicuous place, one or more of the "Hog Cholera" and "Suspicious Swine Disease" cards, bearing in mind that you are quarantining only the yards, sheds, pens, etc., where hogs have been confined. Please distribute copies of the law and hog cholera circulars freely in this neighborhood. I think it would be wise for you to read the hog cholera circulars and law carefully, that you may give the neighbors such advice as they need. Call their attention especially to the last section of the law and see that it is enforced.

The "Notice" cards should be distributed among neighbors whose hogs have not been sick, and who may wish to avail themselves of the protection which the law gives them; that is, the right to issue private quarantine in self-defense.

Neighbors should be warned of the presence of the disease and informed that it is very unwise for them to go where sick hogs have been kept on other farms; and equally dangerous to permit visiting neighbors to go into hog pens or yards.

I hope your people will realize that hog cholera is infectious, like small-pox or diphtheria, and must be conveyed from farm to farm, otherwise it does not spread.

The fact that there has been no sickness during the past few weeks among hogs on a farm where there has recently been an infectious swine disease gives no assurance of safety. The farm may still be infectious and should be so regarded. It may be necessary for you to watch this thing closely for several months. It is folly to waste valuable time in discussing the name of the disease that is now prevailing in your township. The name is the least important feature; but if it is infectious, *i. e.*, catching, it is hog cholera and must be treated as such.

Very respectfully,

M. H. REYNOLDS.

As nearly as possible we send a field veterinarian to each outbreak with instruction to stay as long as necessary, and to visit chairmen of all adjoining townships for the purpose of getting them ready for possible trouble.

The following regulations were adopted last summer and are now in force:

HOG CHOLERA REGULATIONS.

"All railroad shipping pens in the following counties are hereby declared to be probable or possible sources of infection for hog cholera: Fillmore, Mower, Freeborn, Faribault, Martin, Jackson, Nobles, Rock, Pipestone, Murray, Cottonwood, Waton-

wan, Blue Earth, Waseca, Steele, Dodge, Olmstead, Winona, Dakota, Scott, Sibley, Renville, Yellow Medicine, Lac qui Parle, Chippewa, Kandiyohi, McLeod, Carver, Anoka, Stearns, Pope and Swift.

“(1) Hogs must not be removed from any railroad shipping pen located within the aforesaid counties, except for shipment by rail to some point for slaughter.

“(2) Hogs shipped from point to point in Minnesota, or from another state into Minnesota and not intended for immediate slaughter, or exhibition at the State Fair, must be crated, shipped in other than stock cars, and accompanied by a certificate stating that they were free from disease when shipped and that there had been no hog cholera in the neighborhood from which they were shipped for a period of at least six months previous to shipment. This certificate must be signed by a licensed physician, veterinarian or health officer, and must be delivered to the local health officer of the district into which the hogs are shipped.

“(3) Hogs for shipment in crates must not be permitted in or loaded from railroad shipping pens.

“(4) Hogs intended for exhibition at the State Fair must be shipped in cars that have never carried hogs or in stock cars that have been disinfected by the railroad company according to agreement with the State Board of Health. They must be shipped in crates and must not be loaded from or through any railroad shipping pens. Upon arrival at the fair grounds and before unloading, the person in charge shall be required to sign a certificate stating that the hogs were free from disease when shipped and that there had been no hog cholera in the neighborhood for a period of at least six months previous to shipment.

“Managers of county and district fairs held in any of the counties named above, are requested not to have swine exhibits in connection with such fairs during 1898.”

SWINE EXHIBITS AT THE STATE AND COUNTY FAIRS.

These have furnished us a difficult problem. Some of the conditions imposed last year were plainly impractical, and our plans for '98 are considerably different. This fall we made such arrangements with general freight agents that swine for exhibition at the State Fair came in other than stock cars, or in stock cars that had never carried hogs, or in stock cars that had been especially disinfected and provided for this purpose. Ten days

before the fair opened, general freight agents were furnished with a complete list of all intending swine exhibitors, and then they provided sufficient horse cars or new stock cars or stock cars that had been disinfected by steam in the shops, for this special work. Each freight train passing through places from which swine shipments were to be made, carried two such cars on Thursday, Friday and Saturday before the fair. Upon arrival at the fair grounds each exhibitor was required to sign a certificate to the effect that his hogs were free from disease when shipped and came from a neighborhood in which there had been no suspicious swine disease during the past six months. All hogs were inspected on their arrival by a representative of the State Board of Health, and thereafter daily during the fair.

Pens have been so altered that visitors cannot climb into them, and an extra partition, made tight, has been placed between pens so there can be no possibility of manure or litter or other possibly infectious material passing through from one pen to the other.

I have been furnished with a list of exhibitors and all swine exhibits will be followed to their homes by correspondence that we may know whether our work succeeded. A small circular has been issued to exhibitors, and through the general offices to the local railroad agents, informing them of the conditions that have been imposed. This circular also informs exhibitors of the precautions that have been taken for their interests. Our rules provided further that if daily inspection discovered any sick hogs, such hogs were to be isolated in pens especially provided. If the disease proved to be hog cholera all sick hogs were to be promptly killed and the carcasses buried.

At the larger stock yards, for instance South St. Paul and New Brighton, where government inspection is maintained, we co-operate with the federal government by giving government inspectors authority as representatives of the State Board of Health. This plan has proven very satisfactory with several outbreaks of sheep scab and hog cholera which appeared in these yards. The following blank when filled out by these representatives of the bureau and State Board of Health, gives needed information as to the place from which such diseased stock was shipped, township in which they were fed, etc. In this way it is possible to trace diseased animals back to the township from which they came.

Infectious Diseases of Animals.

MINNESOTA STATE BOARD OF HEALTH.

F. VIII. 3-7-98. 1M.

Report of Diseased Animals Received at-----Stock Yards.

Disease*-----
 Point of shipment.-----
 Number and kind of animals.-----
 Fed by-----
 Fed in township of-----
 Consignor-----
 Consignee-----
 Number diseased animals-----
 Disposition of diseased animals-----
 Remarks-----

Signed,-----

Inspector.

NOTE.—Please report promptly in duplicate to the Veterinary Department of the Minnesota State Board of Health.

To illustrate how nicely this plan works let me give you an instance. On August 30th Dr. McBride, Government Inspector and authorized agent of the State Board of Health at South St. Paul stock yards, received a telegram from local health officers at Hutchinson, Minn., to look out for a load of sick hogs shipped that afternoon. When the hogs arrived Dr. McBride was waiting for them. The entire lot was promptly quarantined and killed under inspection, 18 being condemned and tanked. Upon receipt of a prompt report from Dr. McBride I wrote to the proper local health officer near Hutchinson, and the hogs, pens, and yards on the farm from which these hogs were shipped have been promptly quarantined.

I might suggest, for the benefit of others who are trying to solve some of these problems in state medicine, that we work in close co-operation with the city health departments of the larger cities. This plan has proven very economical and satisfactory. One inspector in Minneapolis and another in St. Paul are given authority as agents of the State Board of Health so that in case diseased animals are taken out of quarantine or removed into the country before quarantine can be established, the city representa-

tives can follow them without a lot of red tape correspondence with the State Board.

The hog cholera situation in Minnesota at this date (August 15, '98) is much more encouraging than at this time last year. Comparatively few outbreaks have appeared at this date, although I take it for granted that we will have trouble during September and October when stock buyers and threshing crews are abroad and farmers have commenced fall feeding. I have no means of knowing just what relation exists between hog cholera and conditions of food and care, but I have a lingering suspicion that when the hog cholera chapter is finally written, there will be something other than bacilli in it.

I take pleasure in showing you two maps, one for '97 and the other for '98. These maps show, by the sizes and colors of the painted spots the location, and period during which outbreaks occurred. I am aware that hog cholera is less prevalent in other states than it was in 1897, and yet I think it probable that our plan of interesting and educating farmers and especially local health officers along hog cholera lines in addition to quarantine, has contributed materially to our present condition.

The number of counties does not represent the number of outbreaks, for one outbreak may involve corners of four different counties as an outbreak in the eastern side of one county may extend into the western side of another. During July and the first part of August, '97, the reports came in rapidly.

Perhaps some one is already saying, "But do you really consider individual farm quarantine for hog cholera a practical thing in extensive outbreaks?" I do consider such individual farm quarantine entirely practical in recent and limited outbreaks. It can be made successful in extensive outbreaks, providing we have chairmen of townships who are active and willing to do considerable work for comparatively small pay, and do their duty in spite of opposition, and provided further that these Boards or Supervisors have the support of their influential and intelligent farmers.

We have been able to find such conditions in Minnesota quite frequently, but there have been exceptions. I do not suppose for a moment that this work is ideal, and yet we have accomplished results that have been fairly satisfactory to ourselves and to the stock interests of the state. When farmers are generally convinced that hog cholera is an infectious disease, and are better informed concerning their duties, our work will be easier and more satisfactory.

It is quite reasonable to suppose that in the near future we will be provided with a vaccine that can be economically produced, concentrated, conveniently administered and thoroughly practical. When this happy day arrives we will have means that can be used to great advantage in connection with such quarantine as has been outlined in this paper. If an outbreak appears on a certain farm all hogs on neighboring farms for several miles, can be promptly vaccinated. In this way we will not only have all the safeguards that may come from quarantine, but we will also be able to "back fire," as it were, against the disease.

WILD AND CATTLE DISEASE.

BY H. D. FENIMORE, D.V.S., KNOXVILLE, TENNESSEE.

For several years past large numbers of cattle have died in East Tennessee of a malady known as Wild and Cattle Disease. It continued in its deadly course until quite a serious outbreak of it occurred in the State Experiment Station herd, when Dr. Chas. W. Dabney, the President of the University, ordered it investigated. It was recognized through the assistance of Dr. Norgaard, as the disease described by Bollinger in 1878 under the denomination of "Wild Und Rinderseuche."

It is a specific infectious disease that attacks very many species of animals such as the deer, elk, wild and domestic hog and cattle. It has also been seen in the horse and dog. In certain sections of Europe, notably, the German Empire, it has killed large numbers of wild animals confined in parks, as well as domestic cattle. In this country it has been observed in Virginia, Texas, and now in Tennessee.

The symptoms are loss of appetite, constipation, diminished flow of milk, increase of temperature in the early stages of the disease, after the animal gets very anaemic the temperature drops to about normal. The mucous membranes become very pale, the constipation is followed by diarrhoea and the faeces are frequently stained with blood. The intestines are more or less distended with gas. There is a dropsical swelling hanging from between the lower jaws that preserves the imprint of the finger. This

symptom, with the loose bloody condition of the bowels, is very characteristic and aids very much in an easy recognition of the disease. In some cases the soft parts of the head, face, neck, shoulders, brisket and lower part of the legs are the seat of large oedematous swellings. The hair is bristling and the epidermic desquamation produces an abundant fur-fur, and in a few cases ulcerations of the skin were noticed.

In the acute form these symptoms may increase rapidly and produce death in a few days or a week, while in a chronic form they may last for months or even a year. From what we can ascertain the disease takes a milder and more chronic form here than in the old country, yet at any time it may assume a more virulent character.

Dr. Salmon speaks of it as an infectious ulcerative enteritis complicated with oedematous swellings under the jaws, neck, and brisket, and frequently accompanied by inflammatory lesions of the pectoral organs. He also says it is caused by a specific micro-organism that belongs to the swine plague group, and resembles that bacillus very much.

On post-mortem examination the digestive mucous membrane of the fourth stomach and intestines is inflamed, swollen, and dotted with ulcers. The mucous membrane from the seat of the ulcers in some cases remains attached on one side and hangs as a flap. The ulcers are particularly noticeable at the outlet of the fourth stomach, along the course of the small intestines and ilio-coecal valve. These ulcers are seen in various stages of development, some as large as two inches in length and smaller ones that are in the process of repair, to cicatrical remains of where they have healed perfectly. Throughout the intestinal tract are found hemorrhages of greater or less extent, with blood clots and a bloody liquid condition of the contents. Diarrhoea being present in most cases the lungs are at times filled with gelatinous infiltration. The pleura is inflamed, swollen, and the visceral layer adhering to that of the chest wall. The outside of the heart shows inflammatory new growth and the pericardium is inflamed and it, as well as the chest cavity, contains a variable amount of dropsical liquid. Croupous lesions are found in the respiratory and intestinal tracts. The lymphatic glands are enlarged and oedematous. The subcutaneous connective tissue over the swollen parts is very much thickened and infiltrated. The abdominal cavity contains more or less liquid, and hemorrhages of the muscles and intestines are very common. All these symptoms and post-mortem lesions

were seen in one animal, but the majority of cases seen, were of the intestinal type.

It is not well known how the bacillus enters the system of the affected animals, but it is probable that it may enter through wounds of the skin. It may also be taken in with inspired air and gain entrance through the respiratory mucous membrane. The most probable source of infection of the subjects that came under our notice is through the medium of food, or drinking water, thus accounting for so many cases affected with lesions of the alimentary canal. In the absence of inspection laws the meat and milk of the affected animals have been consumed, but there has been no case reported where the disease was communicated to man.

Since writing the above I was called to see a sick cow, it was evident at once was suffering with "Wild and Cattle Disease," and was explaining it to the owner when he told me he had lost a deer a few days before with the same characteristic symptoms, namely : loose, bloody condition of the bowels, elevated temperature and oedematous swellings. The disease is causing a great loss in this locality. The cow and deer were pasturing in the same lot, and I traced their contact with other cases that I had had.

POINTS OF VALUE IN A COUNTRY PRACTICE.

BY S. S. WHITBECK, DECORAH, IOWA.

GENTLEMEN : I wish to call your attention to a few points in veterinary practice that may, at least, interest country practitioners, and hope, through criticism, to get the ideas of some of the best men in the country on the points mentioned. The ideas here presented are from a country practitioner's standpoint. We take it for granted that all city veterinarians have large, well equipped, up-to-date hospitals. All country practitioners should have at least a small one, of six to eight stalls, part single, part box ; two box stalls well padded all round for violent cases ; force pump or city water works to flood the floors with, small tank above for application of cold or hot water through a tube. The constant application of cold water to swollen shoulders and fistulous cases

will nearly always remove the swelling and make the after treatment much more simple and effective. All recent bruises and strains are much benefitted by a short course of cold applications. A fast horse was brought in one night that had just thrown out a good sized curb by falling from an approach to the barn. He was so lame that he could hardly use the limb. Cold water was forced upon the enlargement through a small rubber tube over night, and the curb could hardly be seen in the morning, while the patient was resting the opposite leg. In intense fever and swelling after an operation, a cold stream forced upon the surrounding parts over night, and a teaspoonful of aconite tr. repeated in three or four hours will generally arrest the dangerous symptoms in a few hours, and materially reduce the swelling. In fractures and severe contusions, a hot stream is best and is easily applied by means of a small oil stove. Aconite may be used as above if there are symptoms of severe inflammatory action.

No one with any hospital practice should be without a stocks. They may be made in almost any design, well braced, and should always have a roller on each side to raise the patient from the floor when necessary. Any stocks can be used by one person, and will be found invaluable in detaining fistulous and poll evil cases and for any of the minor operations. It saves time in looking up help, looks better than casting every time you wish to touch a bad case, and is much safer to operator and patient alike than the twist alone. The writer has stocks which cost \$17 completed, and would prefer going without an operating table rather than without the stocks. In it fractious cases of all kinds can be safely dressed. Any part of the animal economy from head to foot can be made practically immovable and a twist can be fastened to front standard, on either side, by means of a staple and snap. While an operating table furnishes a very nice method of detaining the patient for many operations, yet, with the economical stocks on hand, the table may be dispensed with. But one or the other is almost absolutely necessary in caring for most of our hospital cases. I fear, however, that too many operators prefer the use of table, and close confinement to the use of chloroform, and right here let me say that there is nothing in our practice that looks nicer or gives a better impression than properly chloroforming a patient for every operation that is at all severe. I believe that with a little more experimenting, horses and cattle can be chloroformed almost instantaneously by the injection of chloroform into the jugular vein. I have tried this on five old horses, and several

old lump-jaw steers that were incurable, and have had no unfavorable results from it. The operation may be commenced at once, and, if of any duration, the anaesthesia may be prolonged by the application of ether or chloroform, half and half to the nose. To date I have used from two to four drams for one injection and kept one patient under treatment two hours, by inhalation of the mixture. All the cases were subjects for the grave. Of the horses two were killed after being kept under for an hour; the other three were up afterward for two hours and injected again and killed. One of the steers is alive yet; two were kept for a day and the others killed at once. But little chloroform is needed and much time is saved. No one should use any of the anaesthetics without having anyl-nitrate or nitro-glycerine and hypodermic syringe at hand although in my own practice, I have never had to use any restorative agent. Many of the operations that were formerly very dangerous and as painful, are now performed with much less pain and little or no danger. In the operation on cript-orchids, for instance, we used to think it necessary to insert the hand and arm; but now out of ten cases, perhaps, operated upon by simply inserting one or two fore-fingers, and working them in catch fashion forward and out, the cord may be caught up and brought out, then the testicle. This method of performing the operation is very simple and the danger is very slight—scarcely any more than in common colts. The patient should be thrown or placed with the head down hill so the intestines will not be in the way; and the under rope should be brought back and up over the hip to upper foot so that limbs cannot be extended and put the muscles in pelvic regions to the strain. The nicest instrument for any castrating is the small sized emasculator. Bleeding is less liable to follow. The work can be done more quickly and the instrument is more easily kept clean than the ecrasure. True, in some cases where the testicle is fastened internally, an ecrasure is necessary and may be passed into the abdominal cavity.

In deep seated fistula cases, where the pus has burrowed between the shoulder blades, the patient may be laid down in a soft bed in as easy a position as possible, and kept down any length of time. One case of very fractious disposition I laid down this way, and kept him there five weeks. He made a good recovery, all the matter escaping as soon as it formed, and the patient, after a few days, became as tame as a kitten, eating and drinking generally in the sitting posture, then lying down again.

He was turned over three times a day by means of a pulley and rope.

Since listening to Prof. Reynolds' paper in Chicago, I have tried both trephining and seatoning. In trephining a little sack soon forms below and defeats us but by passing a strong, carbolized, muslin cloth from bottom of cavity down and out in front of shoulder, a perfect drainage is obtained, and most of the cases will do nicely.

In fracture of the limbs where splints or plaster of Paris bandages have to be applied, I very much prefer keeping the patient down and find the owner generally prefers it to the slings. Of course some of them will struggle for a time, but not as much as one would expect. A good many horses have more than horse sense. With a good bed and oft turning there is but little danger of bed sores and the patient will generally accommodate himself to the position very readily.

While there is plenty of room for advancement in Veterinary surgery there are likewise many things that we must learn yet, in a medical line. One Veterinarian well up in his profession writes, "We have no good treatment for bog spavins, puffs, curbs, capped hocks, etc." I will admit that we know of nothing that works very quickly, but to the patient I suggest the following absorbent blister: Mercuric chloride—oz. 1. Gum Camphor—oz. 1. Alcohol—oz. 3. Put mercury in solution in alcohol; then add turpentine to make a pint. Clip hair from enlargement and wash clean. When dry, rub in the above preparation with swab for three successive evenings. On the fourth morning wash clean and grease. Wash and grease every other day until skin is healed, then repeat as before. Repeat thus five or six times leaving animal as quiet as possible in the meantime. In the soft enlargements, bandages may be drawn tightly around the enlarged parts every evening after applying the blister, also during the interval between blisters if desired. This does no harm in the treatment of curbs and capped hocks, rather hurrying the process of absorption. The bandages should be left on just over night, while the patent arrangements for same purpose may be used several days at a time. The blistering with this making an ideal treatment, and nine times out of ten produces a satisfactory conclusion. After five or six series of blisters the patient should be turned in pasture or put at light work where there is no lameness remaining. About two years ago I was called to see a sorrel mare, eight years of age, left hip shrunk

very badly, bog spavin extending all round joint. The animal was so lame that she could hardly step on her foot. I ordered the above blister alone, taking about two months to apply the six series of blisters, and then turned the patient out to pasture. In three months more the owner went out to get his mare and did not know her at first, for the animal was as sound as any and as round as an apple. But little of the enlargement was left, and this disappeared later on. The animal has been used as a delivery horse since and remains sound.

Since then, I have used this preparation on many curbs, capped hocks, puffs and similar enlargements with excellent results.

The method of applying one blister after another as soon as the skin is healed until several have been applied, works very nicely on bone spavins, ringbone and splints. Have removed lameness frequently by this process where firing has proven a failure. Paid over \$30 for a Paquelin cautery that I am now ready to make any bright young man a wedding present of. In fact I believe that blistering like any other form of treatment must be kept up for some time if the best of results is to be attained. The usual way of ordering one or two blisters is simply a starter.

In the treatment of black-water, the writer has found the lithium treatment to work very nicely in connection with bleeding. From three to six quarts may be drawn, according to the size of patient, with decidedly beneficial results. Two to four drams of the lithium may be given for a starter and will generally be sufficient. Flax gruel should be given every two hours at first, and then thrice daily all through the attack. This serves as a soother of the kidneys, and a laxative at first and a nutriment later. In all cases of azaturea, I give ten to fifteen drops of 1 per cent. sol. of nitro glycerine, six to eight intravenously, repeating the first two or three doses every hour, and every three hours through the attack. This lessens the tendency to spasmodic action of both voluntary and involuntary muscles, thus counteracting any tendency to sudden death ; lessens the tendency to inflammation of the kidneys by promoting a flow of blood to the skin and extremities, regulates the heart's action, and in my opinion surpasses strychnine, as a nervo muscular stimulant further on. Nitro glycerine also makes an elegant stimulant in parturient apoplexy, given as above, and in connection with other proper treatment works equally as well in influenzas. In

fact any place where a quick nervo vascular stimulant is needed, nitro glycerine is worthy of a trial.

In torpid conditions of the intestinal tract in horse or cow, in hoven, distension of the rumen with food, or indigestion of the third stomach, no better stimulant can be found than liquor ammonia acetatis in good sized doses, having a powerful action on the entire glandular system. Most of my cases of impaction of the rumen are cured without an operation by the use of epsom salts to begin with, and three ounce doses of liquor ammonia acetatis, repeated every two hours until the bowels begin to move freely. I remember a bad case of this that had been treated by a country gentleman for one week ; then I was called in, and finding that plenty of cathartic had been given, I ordered four ounce doses of this liquor every two hours until the bowels began to move freely, then every four hours. The cow was so weak at the commencement of my treatment that she could scarcely stand ; but by next morning, she was much better and made a nice recovery. Have tried it in poor digestion, and constipation in human practice with very satisfactory results. Two to four teaspoonfuls an hour before meals, often getting quite a laxative effect from its action alone. Indeed the writer of this paper was bothered with dyspepsia, constipation, and, judging from my feelings at the time, nearly all the diseases the digestive tract is heir to. After trying most of the doctors and all the remedies resorted to in such cases, I happened one sad day to think of the old cow, and her marvellous recovery, and decided to try the treatment that saved her, feeling that our troubles were somewhat mutual ; and to its action no doubt I owe the privilege and pleasure of being with you to-day.

ARMY VETERINARY SERVICE.

BY VETERINARIANS CORCORAN AND TREACY, 8TH CAVALRY.

MR. PRESIDENT AND GENTLEMEN : You do me much honor, as you do my army colleagues, by the invitation to read a paper on the History of the U. S. A. Veterinary Service.

The ablest writer, even a romancer, can do little without a basis, and as there are no records of our services, I fear my efforts will be inadequate and uninteresting.

In the glorious era of the immortal Lincoln, our army veterinary service first saw the light. That great and good man, appreciating the service of veterinarians in the army, offered them commissions as lieutenants, which they refused, believing themselves entitled to higher rank. Soon afterwards in 1863, there was one appointed to each cavalry regiment, with the pay of a lieutenant (\$75 per month) and the nominal rank of Sergt. Major, to entitle them to allowances, quarters and fuel, etc., but the provision of retirement for disability and long service, evidently contemplated at the time, was overlooked in those exciting and trying times, and has been overlooked ever since.

In 1866, at the reorganization of the Army, four more regiments of cavalry were added, and from the sad experiences of the immense losses of public animals during the war for want of adequate veterinary service, two veterinarians were assigned to each of the new regiments, one at \$100 and one at \$75 per month and so it continues to the present time. I will now have to pass over nearly ten years of which I have little knowledge.

About 1875, Dr. Samuel Going was appointed to the first cavalry, then stationed at Benecia Barracks, Cal., and the officers of that old regiment received him as a gentleman, and an equal. Very soon, or immediately on his arrival, he discovered and suppressed an epidemic of glanders in his regiment. Though he was badly handicapped by a want of confidence in him on account of his youth, he soon demonstrated the truth of his diagnosis, and won a confidence and respect for the profession that will always continue in that regiment. About 300 horses with their stables and equipments, had to be destroyed. His career as an army veterinarian was a bright, though a short one, for after the breaking out of "The Nez Perces War," he sealed his service to his country with his promising young life, on a perilous expedition, with a lieutenant and ten (10) men none of whom returned alive. His body was afterwards recovered and buried with the honors of war at Fort Walla Walla, Washington.

He was succeeded by R. B. Corcoran. Corcoran transferred to the 8th in 1886, and was succeeded by Lemay now of the 7th, and he replaced by Piche, who later retired to a position in civilian life, now W. Going, formerly of the 7th, and brother of the brilliant young veterinarian quoted, presides over the veterinary destinies of the old regiment.

The Second Regiment has always been the friend of the profession, enhanced in the early '80's by the genial jolly little

"Humphreys" who cast sunshine on all circles he came in contact with. He also consecrated his young and hopeful life to the service, in the line of duty in '85, and as the pet of his regiment, will always have a place in its fondest recollections. Dr. W. V. Lusk, now treads in his foot-prints, a progressive and energetic advocate of our cause.

The Third Regiment I know very little of, except that its present veterinarian, Dr. Waugh, has now for many years given faithful public service.

The Fourth Regiment's Veterinary Service has now been in charge of Dr. Alex. Plummer for about seven (7) years, and as a proof of his proficiency, he was selected to accompany Gen. Merritt's expedition to the Phillippines, where he now is.

The Fifth Regiment is to be congratulated on retaining the service so long of the able, gifted and generous Dr. Griffin, who is one of our legislative "hustlers."

The Sixth Regiment has recently lost the services of our most progressive and untiring worker in our legislative progress, Dr. Turner. In fact, we all miss him sadly, for he spared neither brains, energy of money, for the general elevation of the army veterinary service, and deserves everlasting gratitude. His successor is Dr. ———, a man of ability in his profession, and I have no doubt, will try to keep in the footsteps of his popular predecessor.

The Seventh Regiment's Veterinary Service is now in charge of two very able and progressive men, Drs. Lemay and McMurdo, whose bright records cannot be made more brilliant by anything I can add.

Dr. Holsinger was one of this fighting regiment's earliest veterinarians. He was killed by the "Sioux" in the Stanley Campaign, in the Yellowstone Valley in 1873. Dr. Tempany now of the 9th, was also veterinarian of this regiment in 1873. Dr. W. H. Going, now of the 1st, and your humble servant, were associates and colleagues in this regiment in the eighties.

The Eighth Regiment has had some brilliant men as veterinarians, but for some reason was not able to retain their services. In 1886 Veterinarian Corcoran transferred from the First, and in '89, I had the good fortune to become his colleague. We have worked in energetic unison ever since for the general good and elevation of the army veterinary service, and now we are gratified to be ably supported by our Colonel, General Bacon.

The Ninth and Tenth (colored) Regiments have recently

added still more laurels to their already creditable records. They are represented by Drs. Tempny and MacDonald, 9th, Drs. Service and Foster 10th. Tempny and Service are each men of more than 35 years' service, and though naturally enfeebled by age, and the perilous privations of frontier life, in those long years they did not hesitate to respond to their country's latest call, even though disability meant disaster. MacDonald and Foster are so well known to the profession that any laudation from me, is unnecessary. They are of considerable army experience and strongly advocate army veterinary progress.

Critics on army matters in the East are recently rampant. If they were but just to us, for only by agitation do we hope for favorable army veterinary legislation.

Some charge the army authorities as being the cause of inefficient veterinary service,—nothing could be more erroneous, for Gen. Miles is now, and always has been the greatest advocate of advancing the army veterinary service, as are all other ranking officers of note.

Some other cruel critics, libelously charge the "personnel" of the veterinary service as being inefficient, and the cause of the immense annual death and condemnation list. Had those gentlemen been but just, and critical in the proper sense by investigating into the root of this unnecessary loss, it would save me the painful duty of submitting a few of the salient causes of this waste, for except in the treatment of sick and disabled horses, the army veterinarians are seldom consulted on the subjects pertaining to their profession.

Remounts for cavalry and other public animals are supplied by the Q. M. Department and purchased by an officer of that department, without any veterinary technical training, assisted by some civilian expert, employed by him, who usually knows about as much and cares less as he is not responsible, and his job is but a transitory one at best.

Many of the remounts have come from the hands of the "City Sale Stable Artist," fixed up to deceive the quartermaster amateur expert, clipped and shod with polished hoofs, to cover defects of perpetual pavement "pounding." Others are "toppy" from the use of the "overdraw" in buggy use, and probably forced on the market by the bicycle, but in conformation not suited for active cavalry service. A number come to us incurably unsound and many rapidly approaching that condition. At all the military stations scattered over our broad continent, forage is inspected and received

by young officers acting as quartermaster (frequently of the infantry branch) who have little, if any, knowledge of its nutrition or quality. Chronic asthma is consequently developed through its indigestibility and mustiness. This is another cause for a large annual condemnation list for which the army veterinarian is not responsible. A colleague informs me that at a post at which he was stationed, the infantry Q. M. would not receive anything but swamp or "slough grass" as hay, for it was "green and good looking," while good upland was rejected. At the same post, a good-natured but too confiding infantry quartermaster received from a "smart contractor," through his irresponsible subordinate, a year's supply of hay of so inferior a quality that the veterinarian had to emphatically protest against its further use by reason of diabetes and asthma it produced.

I am glad, gentlemen, that those conditions do not generally prevail, for at cavalry regimental headquarters closer attention is given to forage supplies. Veterinary medicines, dressings, and instruments are supplied and I believe purchased by the quartermaster's department. They are antiquated and inadequate and of little use in the modern treatment of disease. They are drawn quarterly and frequently without reference to the requirements of the veterinarian, causing an annual loss hard to estimate. Should a modern drug be required, for any special disease, it can be had only by special requisition by the Q. M. General and on its arrival (if it should arrive) the patients are more than likely bleaching on the prairie.

I will impose one more subject on your attention in answer to your critics, viz., Horseshoes and Shoeing. Up to 1887 the army regulations on horseshoeing were as follows :

Horses should be shod at least once a month. The length of the hoof indicates when a horse needs reshoeing rather than the wear of the shoe. In removing shoes, raise the clinches first, lest the crust be torn and stubs left in the horn. Pare the sole until it yields under the pressure of the thumb ; cut the walls down until they are but little higher than the contiguous sole, taking care to shorten the toe if necessary, it being frequently left too long ; cut away the bars so as to make a gradual slope from the walls to the bottom of the commissures which must be deepened ; lower and open the heels and take the bearing off them for at least an inch on each side of the frog, so that the walls at those parts will not be in immediate contact with the shoe when first put on. Pay special attention to the removal of the pegs (the hard horny sub-

stance which grows down at the heel on each side of the frog and contiguous to it); these pegs are apt to contract the foot or make it thrushy by pinching and narrowing the frog. The frog may be pared to stimulate its growth and the cleft opened, otherwise it is left untouched.

If a horse be flat-footed, pare the base or forward part of the hoof very little if at all, and shorten the toe as much as possible.

Forge the shoe to fit the foot; do not let it project beyond the heels; make its lower face perfectly flat. Avoid nailing too far back, particularly on the inside quarter; this is to be especially attended to in the fore foot. Use as few nails as possible. Six are enough for an ordinary fore foot and seven for a hind foot; horses with small feet should be shod forward with five nails only. In driving take care to give the nails an outward direction so that the points be brought low down in the crust. Turn the clinches down so as to be broad and firm. In rasping them, never rasp the whole surface of the hoof. When calks are used, there should be three, one at the toe, the others at the heel."

After many years agitation by the army veterinarians against this form of "foot butchery," my present colleague and myself were ordered to meet or report to a Board of Officers at Jefferson Barracks, Mo., in April, 1887, for the purpose of improving the system of horseshoeing. After discussing the subject with the Board and making recommendations, etc., the following paragraph was inserted in the new cavalry regulations.

"In preparing the horse's feet for the shoe, no cutting whatever with the knife is permitted, except when necessary to fit the toe clip. In removing surplus growth of that part of the foot which is the seat of the shoe, use the cutting pinchers and rasp. Opening the heels or making a cut in the angle of the wall at the heel, must not be allowed. Flat-footed horses should be treated as the necessity of each case may require. In forging the shoe to fit the foot, be careful that the shoe is fitted to and follows the circumference of the foot clear around to the heel; the heels of the shoe should not be extended back straight and outside of the walls at the heel of the horse's foot, as is frequently done. Care must be used that the shoe be not too small and the outer surface of the wall then rasped down to make the foot suit the shoe. The hot shoe must never be applied to the horse's foot under any circumstances. Make the upper or foot surface of the shoe perfectly flat so as to give a level bearing. A shoe with a concave ground surface should be used.

In garrison at the discretion of the colonel or commanding officer, the horses may be left unshod. Shoes will be fitted and kept ready to be put on the horses."

But the veterinarians received no credit for the improved condition. And while these do not cover all our recommendations, they are quite a revolution from the former pernicious practices, and mind you, gentlemen, an immense salary was at that time paid by the War Department to a so called "expert" for propagating and perpetuating this dark age brutality.

It is now more than eleven years since that Board met and made its reformation of the regulations, still we have not yet been furnished with the shoes recommended. They still come from the Q. M. Department unwieldy masses of iron, with no conception in their conformation to their scientific application, as required by regulations. Our horseshoers, while usually well instructed by us, can do little good work, with the material furnished. It is also difficult to retain good workmen on the pay they receive—\$15 per month.

Then our cavalry of at least 12,000 horses, besides artillery and quartermaster animals, of probably a much larger number, are scattered over our vast domain, besides those in our new tropical possessions, with only fourteen regular army veterinarians, and those without sufficient authority to have their wishes or instructions respected.

The station of the army veterinarian is at regiment headquarters where usually only a portion of the regiment is located. Take for instance, the fourth cavalry before the recent war, its headquarters at Walla Walla, Washington, with its veterinarian and only two or three troops—while four troops of the same regiment at Presidio, California, and two in the Yellowstone Park, were far beyond the reach of the regimental veterinarian, and this condition applies generally. For this reason alone we should not be regimental employees but army ones.

The different stations of the army are visited annually by an inspector, and all animals permanently disabled from this time till his next annual visit, are foraged and cared for. They are then presented by troop commanders, for condemnation, frequently without reference to the veterinarian, while neither the inspector or troop commander have any pretensions to veterinary attainment. Then a large percentage of these condemnations is for "unsteadiness in ranks" "won't stand fire," "viciousness," etc.

Now after placing these different items as plainly as it is pos-

sible for me to do, you will unlike our critics, kindly relieve us of the responsibility of their claimed immense annual animal loss, and place it where it belongs, and not on the army veterinarians.

We have now in the regular cavalry at least 12,000 horses. Those at \$150 each, which is about the price paid by the purchasing quartermaster in peace times, amount to \$1,800,000, and presuming the 25 per cent. annual loss of our critics is correct, \$450,000 would be the amount each year. Then we have other public animals (artillery) and (quartermaster) of at least the same number and value. Presuming the same annual loss in those quarters, another \$450,000, or a total annual loss of \$900,000.

It was but recently I had the honor of being connected with a board of cavalry officers in purchasing remounts for my regiment. The price paid, \$100 each, was an emergency one, as suitable horses under ordinary conditions, would not be worth much more than half that figure. Those remounts are more serviceable than those supplied by the Q. M. Department at \$150 each and are at least *sound*. Then even at the figure paid, it would mean, applied to the cavalry alone, a difference of \$600,000 or \$150,000 per annum as applied to "The Claimed" 25 per cent. condemnation list.

The forage ration is composed of 12 lbs. of oats, 14 lbs. of hay, and 3 lbs. of straw, or hay, for bedding, daily. A great saving could be made on the grain ration, under proper veterinary supervision. In a mild climate, where grazing is to be had, which is at all frontier posts, during inactive service, and under other conditions, known to the experienced army veterinarian, half the grain ration could be saved in many instances for many months, and with benefit to the animals, while in some cases the full ration will be always necessary. To be within the limits, we will say a reduction of 3 lbs. per diem for 6 months (180 days) on all public animals. $24,000 \times 3 \text{ lbs.} \times 180 \text{ days} = 12,960,000 \text{ lbs.}$ at $1\frac{1}{2}$ cents per lb. (which is a low figure) = \$194,400 annually. Now, while I claim this saving can be made annually, by a reduction of grain ration, and with benefit, this reduction should be made only on veterinary advice.

Other large losses might be enumerated, viz. from the purchase by incompetent officers, and issuance of antiquated veterinary medicines, etc., from foraging horses after they become unserviceable until the arrival of inspector, on his annual visit. From original cost of excessive iron and freight on unwieldy horse shoes supplied, from loss sustained by incompetent inspec-

tion of forage, etc., etc. You will naturally ask, how can this immense annual loss be curtailed or stopped? Make the army veterinarian a commissioned, responsible officer so that he may have an authoritative voice in all those matters, and at least a half a million a year will be saved to the treasury of the country. Ah, but gentlemen, this would be interfering with the sacred prerogative of the mighty purchasing power of the Army. We have labored, argued, agitated and appealed for sixteen (16) years to our law makers—receiving yearly pleasing promises until protracted procrastination has made our hearts grow sick. When hostilities were declared against Spain, and nearly all of our colleagues ordered to the front, we surely thought that our beneficent Government would give us some protective legislation, and several appeals were made by us to the chairmen of the military committees of both Houses to provide for ourselves and helpless families in case of injuries or death, without eliciting any reply. We are forced to the front but cannot get any pension. So far four of our number have lost their lives in active service and their families are allowed to starve by an ungrateful government. We are but fourteen and naturally our cry in the political wilderness of 75,000,000 is too feeble to be heard. So we have come to your powerful professional association, to submit our case.

One or two more items and I will close. Beef and other meats for army consumption are received and inspected by young officers, at the different army stations who do not even assume to know anything on this subject. Other bovine products, milk, cream, butter, are furnished on the frontier posts, from cows kept in unsanitary sheds, and subsisting frequently, in winter, on stable refuse, with no veterinary supervision as to sanitary condition or health. Is it not strange that tuberculosis and other fatal accessories to this condition are not more prevalent?

Commissioned officers of the army are detailed to inspect (?) cattle supplied to Indians by contractors, for consumption. Pardon my dropping from the serious to the ludicrous. At a post in the Northwest situated on an Indian reservation, an old feeble army chaplain, recently appointed, who likely never saw a herd of cattle before in his life, has been for some time the inspector (?), though stationed at the same point is one of the oldest veterinarians in the army, but he had to be ignored because not commissioned. Another commissioned officer of the army, whilst inspecting Indian cattle, was approached by a practical joker who took him aside and in confidence informed him "Captain, there is not one of those steers

that can eat grass, they haven't got a front tooth in their upper jaws—now don't give me away." The officer ordered a steer caught, and cast. There was not an upper incisor to be found—two, three, four, five and six more were examined with the same result. He condemned the whole herd. It is not related what the final result was.

Humanitarians, one item for you and I close. Faithful old cavalry horses condemned for old age, and too often suffering from acute painful disease, are sold, like all others, at auction, and purchased for a paltry sum, having to wind up their miserable existence under new, exacting and brutal masters, when they should be humanely destroyed for humanity's sake.

Gentlemen, our history inadequately presented, now comes to an end.

In a very short time Congress re-assembles. A bill for the re-organization of our increased army will be introduced. Will we again be overlooked? Will you, with your permeating influence (for you represent every state in this great Union) permit the occasion to pass without opening a path for your young and aspiring colleagues that will lead to a glorious future?

Of the fourteen veterinarians now in the army, most are of long service. Some are already old men and must soon make way for our growing generation. Of these fourteen (14), eleven (11) are graduates of some of the best colleges of this continent and of Europe, and of the three non-graduates, two are men of over 35 years' service which ought to be a guarantee of their competency. The other, my colleague and friend, whose name has often been mentioned in this paper, has twenty-one years' service to his credit.

Surely those old men who have fed and fostered our infant science on the plains of this great West, should be provided for in their declining years, and a justice be done the younger ones that is not denied veterinarians in any army of the world.

Gentlemen, you have our doleful, wasteful history poorly placed before you, and we await your verdict. Shall those faithful old men be cast on the cold world in their infirm years, with the dismal prospect of a Potter's field pauper's grave? These men who kindled the first spark of your now glorious science on the perilous frontier, fanned now into a mighty flame by the beaming magic of your powerful influence, that, I trust will blaze and brighten a way to a prosperous and glorious future for our rising young men, and cast its hallowed light on the retired, and I trust

happy homes of our old colleagues, where they will peacefully await "taps" from the bugle of the Great Commander.

ARYTENOIDERAPHY.

A NEW SURGICAL TREATMENT FOR LARYNGEAL ROARING.

BY L. A. MERILLAT, V.S.

HISTORY.

This new surgical procedure originated at the surgical clinics of the McKillip Veterinary College during the session of 1897 and 1898. The first operation was performed by the clinical instructors November 18th, 1897. It was first advocated by Dr. M. H. McKillip, Dr. W. E. A. Wyman and the writer while discussing the possibility of relieving a very bad case of roaring in a valuable horse presented for treatment.

On account of the low percentage of recoveries, arytenectomy has long since been excluded from the category of surgical operations at the clinics except for the purpose of demonstration. But the appearance of the above patient, together with others continually appearing set the department of surgery to work along new lines.

The first method advocated was to fasten the arytenoid cartilage to the wall of the larynx so as to increase the lumen of the glottis to a degree equal to its lumen during a forcible inspiration. The feat was accomplished by pinning the arytenoid to the ala of the thyroid by means of a silver wire. This simple procedure proved to give only temporary relief as the presence of the wire caused hypertrophy of the cartilage to such an extent as to obstruct the passage quite as much as before the operation. Various other sutures applied in the same manner proved to give the same results. Examination of the parts ten, twenty and thirty days after the operation showed the cartilage dangerously enlarged. It was therefore evident that sewing through the body of the arytenoid as a means of attaching it to the wall must be abandoned.

In the next experiment the vocal cord was excised and the cartilage fastened outward by passing a suture, not through the cartilage itself, but through the mucous membrane at its very edge at a point where the vocal cord is inserted. This is Arytenoideraphy as it is performed at present and while we admit the *modus operandi* and even the results are not beyond the possibility of improvement the indications are that it is a procedure that may be depended upon in all cases of roaring due to complete or almost complete laryngeal hemiplegia.

DEFINITION.

Arytenoideraphy (sewing the arytenoid) consists of suturing the arytenoid cartilage to the lateral wall of the larynx and excising the vocal cord. The object of the latter step is to form a granulating surface the cicatrization of which holds the cartilage permanently in position while the suture performs the same function temporarily during the healing process.

The operation is performed under general anaesthesia with the patient in the dorsal position and the head extended as far as possible. It is divided into three steps as follows :

1st. Laryngotomy, or opening the larynx so as to expose its internal aspect. The incision through the integument and muscles is made slowly and carefully and all hemorrhage arrested before the laryngeal incision is made. The latter incision is confined to the cricoid cartilage and the crico-thyroidean membrane, or in other words from the first tracheal ring to the thyroid base. The thyroid base (Adam's apple) is not disturbed as in arytenectomy.

2d. Excision of the vocal cord. With the aid of a pair of retractors the incision is dilated, the vocal cord raised with a tenaculum and excised with a pair of curved scissors, from its thyroid to its cricoid insertion.

3d. Arytenoideraphy proper consists of suturing the cartilage to the laryngeal wall. A strong silk suture armed with a curved needle is passed through the edge of the arytenoid cartilage at the point where the vocal cord is inserted then through the crico-thyroidean ligament and tied firmly. One stitch is sufficient. As the hemorrhage is slight no tracheotomy tube is necessary to prevent passage of blood into the lower air passages.

RESULTS.

Eleven operations : Six *cures*, two *improved*, two unimproved, one death.

The six cures were in very bad roarsers while the *improved* and *failures* were in horses showing dyspnoea only after considerable exertion. The one death was due to a thoughtless attempt to ligature both arytenoids.

More data is of course necessary to make conservative deductions as to the exact value of the operation but since the six cures were extremely bad cases it is evident that arytenoidraphy is a useful operation when the motility of the arytenoid is destroyed to a considerable extent, and does not—by its movements—disturb the healing processes.

THE PRACTICABILITY OF IMMUNIZING BREEDING CATTLE AGAINST TEXAS FEVER BY THE "TICK-METHOD."

BY J. W. CONNOWAY, D.V.S.,

Veterinarian to the Missouri Agricultural Experiment Station.

The question of immunizing breeding cattle against splenic fever will continue to be a live topic, and one worthy of discussion by this Association, until some efficient and practical method is put into commercial use to an extent that will satisfy the demands of the Southern market for immune pure-bred cattle. That the demand is now large and constantly increasing no one will deny who has given the matter any attention.

Since our Station has been engaged on this problem, a large number of letters have been received from nearly all the quarantined states and several states above the line, inquiring as to the progress being made, showing that a widespread interest in these matters exists. It will suffice to give a few short extracts from this correspondence. One Kansas breeder says: "I am breeding Short-horn cattle and ship two or three cars of bulls to Texas every year, *but find ranchmen afraid to buy pure-bred cattle to ship south of the quarantine line.*" (His shipments probably go to the Pan Handle country, which is a non-infected district.) The following from a Texas breeder: "Grading up is both slow and

expensive" "there are comparatively no Hereford females for sale in the State." "I have lost some very fine cattle, by this disease, that I shipped from Iowa." Again, one of our most enterprising Missouri breeders in speaking of the Southern trade says: "It is certainly a very valuable trade if we can find some way to get at it." "At present such trade as we get below the quarantine is confined to calves under three months of age which are shipped by express and are raised below the quarantine line by their native cows. *Even* a portion of these die from the fever.

The means now resorted to by the Southern stockmen to build up pure-bred herds, and to maintain a high standard of breeding are neither satisfactory to them, nor very profitable to their Northern brethren, from whose herds they draw. It is on account of the high percentage of loss that is sure to follow from the fever, on shipment of mature cattle into the infected territory, that the Southern breeder rarely imports such animals, but selects calves, since they are more resistant to the disease. The difference in price between the mature and young animals is no great inducement toward the selection of the latter. Such difference hardly compensates for the expense and inconvenience entailed in the transportation and care of the young animal until ready for service.

The greatest objection, however, to this method is the uncertainty in the outcome of the young animal. Since family qualities even in the most fancy bred afford no sure guarantee that the young animal on coming to maturity will possess the *individual* qualities that are sought by the purchaser. To illustrate; we have in our experiments one animal that was dropped by a full sister of a short-horn cow that sold at auction for \$1,200. Yet this animal turned out to be such an unpromising individual that he was not kept for breeding purposes.

Another method that is employed, although necessarily to a limited extent, is that of importing mature animals in the winter and keeping them throughout the tick season on disinfected premises. By this plan bulls have been used with safety on Southern cows, after disinfection of the latter. Mature Northern cows have also been kept on disinfected grounds and their produce immunized by natural infestation with ticks. This method is of value to the small breeder, especially the breeder of dairy animals, provided that proper conditions for success can be maintained. This method, however, is plainly inapplicable to that large section of infected ter-

ritory that is mainly interested in the beef breeds. And even with the small breeder this method is not without serious disadvantages.

It seems therefore desirable from the standpoint both of the Southern purchaser and Northern producer that some method should be put into operation whereby every obstacle may be overcome to the most free introduction into the infected territory of breeding cattle of mature age.

In my opinion the solution of this matter lies with the Northern breeders aided by the veterinarians. And I believe that we have in the "*Natural Method*" of immunizing a plan that is safe, easy of application and certain in its results. And while some other method, as for instance that of "blood inoculation," may come into large use, I am confident that the "*Natural Method*" on account of its simplicity will find a permanent place with many Northern breeders.

Before discussing the "*Natural Method*" it will be well to notice briefly the inoculation methods, that have been suggested and to some extent experimented on :

- i. As to the "vaccines" and "tested serums," "for the prevention and cure of splenic fever," that have been advertised in some of the stock papers of the South, it is sufficient to say that unsolicited expressions from Southern stockmen indicate that these efforts of the commercial scientists have served no good purpose, but have biased the minds of some stockmen against the efforts of those who are better equipped for scientific work and more conservative in statement.

2. In regard to the efficiency of sterile serum, from an immune Southern animal, to prevent or mitigate the fever, the final results of experiments made by myself, Dr. Robert of the Mississippi Experiment Station, and Prof. Dodson of the Louisiana Station, indicate that such serum contains neither a toxin nor an antitoxin that is potent to induce a permanent or even a transient immunity. But as our work was not without some faults, we do not wish these results to be looked upon as finally closing this question. As a matter of scientific interest, I would be glad to see the method tested further by those who have the opportunity.

Dr. Francis of the Texas Experiment Station has not lost faith in this method. He writes that during the summer he inoculated 45 head of susceptible cattle and only two had died. The owner diagnosed one of these cases as blackleg. Dr. Francis has not so far as I know ever inoculated old cattle. In the work of Dr. Robert, Prof. Dodson and myself, both old and young

cattle were used, with the result that several of the young animals lived while nearly all the old ones died.*

3. Another method, that of inoculating with *fresh blood* from an immune animal, was first suggested by the investigations of the Bureau of Animal Industry (See Texas Fever Report 1893.) In 1892 the investigators of that Bureau made intravenous injections of fresh blood (28 c.c.) from Southern cattle into susceptible Northern cattle for the purpose of testing the virulence of the blood of the apparently healthy Southern animal. The result was that the inoculated animals contracted the fever; one died and four recovered. This was followed by experiments to test the utility of "blood inoculations" as an immunizing method for commercial uses. But as the representative of the Bureau who had the direction of this work is present, it will be more appropriate to leave to him any further mention of the methods, results, and prospects of this plan.

It will not be out of place to mention in this connection that the above method with a slight modification, (that of defibrinating the blood), has recently had extensive application in Australia; and, judging from the reports, with results that are very satisfactory. In that country, however, it has been used as a defensive measure in territory rapidly becoming infected. A percentage of deaths under such conditions would be borne without complaint that would not be tolerated in a method employed to immunize animals for the market. The reports show some deaths as the result of the inoculation. Whether a larger experience has overcome the dangers of this method and increased its usefulness I cannot say, as the reports of the more recent work in that country have not reached me.

Now as to the plan of immunizing by the "Tick-Method." The first suggestions as to the possibilities of this method for commercial use, come from the Bureau's classical work on "Texas Fever." And it is there indicated that the working out of the economic side of the problems of immunity belongs properly to the State Experiment Stations, since local conditions, especially that of temperature, must be taken into account in applying any method of immunizing against Texas fever.

The work in progress at the Missouri Station is an attempt to carry out in an artificial way, on grounds far removed from the

*See Bulletin No. 37 Missouri Agricultural Experiment Station, 30th. Annual Report of the Missouri Board of Agriculture, and Bulletin on "Texas Fever" by Mississippi Experiment Station.

quarantine district, a method that we believe nature employs in effecting immunity in Southern cattle.

Observations and experiments have shown that Southern cattle are not naturally immune, but have acquired immunity through "tick infestation." In the 1893 Report of the Bureau of Animal Industry on "Texas Fever," mention is made of two calves born of Southern cows, that were attacked by the disease. Dr. Smith adds: "This seems to make it probable that Southern animals acquire at least a part of their immunity by mild attacks very early in life." Dr. Curtice, in the *Journal of Comparative Medicine and Veterinary Archives*, February, 1897, mentions a Georgia planter whose farm is so situated that a portion is kept free from the infection without special effort, while the remainder is badly tick infested. The proprietor states that calves of Southern cows, dropped and reared on the tick-free part of the farm, suffer from the disease when put on the tick infested lowlands of the same farm. Dr. Francis of the Texas Experiment Station, has also observed haemaglobinuria in Texan calves after severe natural infestation with ticks during hot weather.

Although the Southern calves are susceptible to the disease, deaths from this cause are very rare. It seems to be a matter of resistance and not of insusceptibility. As the calf is dropped in the early spring, the first infestation with ticks is slight, and as the weather at this season is not excessively warm a mild attack of the disease is induced, from which the young animal recovers. The reactions that are set up by this mild attack protect the young animal against the more severe attack, that would otherwise result from the heavy tick infestation and hot weather that come later.

The nature of the food supplied to the young animal during the immunizing period favors recovery. The calf, being on milk diet, impaction and inflammation of the manifolds are avoided. While in mature susceptible cattle these conditions, that so frequently determine a fatal issue, result in part from the coarse food upon which these cattle subsist.

On arriving at maturity the Southern cattle have passed through a process of natural inoculation by means of which they are fully protected against fever.

The question arises, can this "Natural Method" be employed on the stock farms of Northern breeders?

This can be answered with confidence in the affirmative. Let us consider the conditions that are requisite for success: First,

the calves of susceptible Northern cows must possess a considerable degree of natural resistance to the disease.

Aside from our own experience there is abundant evidence that this condition can be met. Old stockmen of the Middle West tell us that when trail-traffic in Southern cattle was once so common the mature cattle of exposed native herds succumbed to the fever while the calves, as a rule, recovered. As already mentioned this difference in resistance between young and old Northern cattle has been confirmed by the experience of Southern cattlemen in their efforts to build up improved herds, a large per cent. of the adult imported cattle dying, and a relatively small per cent. of the young. These observations of stockmen have been confirmed by the National and a few State Experiment Stations in the course of experimental work on Texas fever. In the midsummer experiments of the United States Bureau of Animal Industry, about 75 per cent. of the adult cattle and only 25 per cent. of the calves died from acute attacks of the fever induced by tick infestation.

Observations made by Dr. Robert and myself in an outbreak of Texas fever at Enterprise, Mississippi, bear upon this point. In a herd of dairy cattle imported from the North, ten out of eleven adult cattle died, and only two out of sixteen of the young animals. The young cattle range in age from eight to fifteen months.*

It is probable that Northern calves exposed to the infection under the same conditions as Southern calves would prove to be as resistant as the latter. And in the proper application of this method, there will doubtless be no losses.

A second condition is that *the initial infestation should be slight* as an excessive number of ticks in a first infestation is liable to cause a very severe if not fatal attack of the fever, especially in midsummer. Our experiments furnish a case in point. During the summer of 1897 a cow with a calf about six weeks old was used as a control in our experiments on serum inoculation. The calf was artificially infested with a very large number of ticks to test the power of young animals to resist the disease; it suffered from an acute attack and died on the fourteenth day.

The degree of infestation can be more easily regulated on Northern stock farms by artificial methods than in the infected

*These were inoculated with sterile serum from an immune animal, but there is doubt as to whether this had any beneficial effect.

territory where natural infestation occurs. In our experiments the ticks were hatched in improvised incubators, (fruit jars containing a small amount of moist earth, and having the mouth covered with a bit of muslin to prevent the escape of the young ticks). We found no difficulty in regulating the number of ticks that it was desired should infest each animal. With a sharp pointed knife a slit from one-fourth to one-half inch long was made in the muslin cover of the incubator and the ticks were allowed to crawl off, a few at a time, on to the animal. From 25 to 100 ticks were used in the first infestations.

The subsequent infestation should be with an increased number of ticks. Several hundred ticks may be quickly applied by removing the muslin cover and placing the mouth of the jar directly to the skin of the animal. A momentary application is sufficient. In this way a large number of animals may be rapidly infested.

As a third condition we would suggest that *intermittent infestations* are preferable to a continuous infestation. That is, that a second or third infestation should not be made until the previous crop of ticks have entirely disappeared and the animal has had a few weeks' rest from these parasites. In one experiment (1897) three young cattle about 10 months old were infested artificially and later exposed to continuous infestation throughout the summer and fall, on a pasture with ticky Southern cattle. These animals suffered from acute attacks of the fever, became very poor, and one did not have sufficient vitality to withstand the first storms of winter. In another experiment carried on at the same time an animal of about the same age was infested artificially, the ticks ripened and dropped off, and the animal was allowed to remain free from ticks about a month, then reinfested with a larger number of ticks. Considerable fever and gauntness resulted from the first infestation, from which the animal recovered and was in good condition at the time of the second infestation. No marked rise of temperature resulted from the second application of ticks and the animal went into winter quarters in good condition. We have followed this plan in subsequent work on immunizing breeding cattle. It is also apparent that intermittent infestations can be carried out much easier in Northern territory, and by artificial methods, than in the infected districts at the South.

Another condition that must be taken into consideration is that of *atmospheric temperature*. In bovines the mechanism for

regulating the internal temperature is not so nicely adjusted as in some other species ; and on account of this, the temperature of these animals during the most heated part of the summer rises considerably above what is regarded as the normal. This season, therefore, should not be selected for tick-infestation, as the fever induced by the ticks may, in conjunction with the high temperature caused by the hot weather, result fatally in a number of cases even with a mild infestation.

The most appropriate time for the initial infestation is in the spring and early summer before the heated term or in the fall when the nights are cool.

If this work is begun in the fall the young animals should be provided with protection against the cold rains and winds of early winter, as the vitality of the young animal is for a time considerably lowered, on account of the great diminution in the number of red blood corpuscles, due to the destructive action of the micro-parasites that have been introduced into the blood by the ticks. Some time is required for a full regeneration of the corpuscles to the normal number.

In the experiments of last year, we lost two calves from exposures of this kind, some time after all symptoms of the immunizing fever had disappeared.

The matter of *diet* is also important. As already stated the Southern calves undergo the immunizing process while on a milk diet,* and it has been pointed out that the danger of impaction and inflammation of the third stomach are avoided by such a diet. Here arises one difficulty in the way of the Northern breeder although not a serious one. He cannot permit the tick-infested calves to run with the cows, since the latter would become infested and probably die. He must, therefore, resort to artificial feeding of the young animals until he has raised up an immune herd. This can be done in a few years by immunizing the young heifers that are to be kept on the farm. Thereafter the cows and calves may be kept together. The keeping of an immune herd will not in the least interfere with the sale of these animals north of the quarantine line, since the disinfection of a tick infested animal is a simple matter. It is therefore advisable for the breeders of beef cattle who wish to avoid the trouble of

*The opinion held by some that the milk of Southern cows has an immunizing property which is utilized by the calf is probably erroneous, and the only advantage gained by the practice of raising Northern calves on Southern cows is that hand feeding is avoided.

"hand-feeding" to build up immune herds. This is not so important with the dairyman, who is the possessor of a pure-bred herd, since "hand-feeding" is his usual practice.

In our experiments the calves were taken from the cows, in three or four days after they were dropped. They were then taught to drink milk from a bucket ; later a little bran and meal was added to this diet. At the end of six or eight weeks if the calves were doing well they were infested with ticks.

One of the first questions that will arise with the Northern breeder is, *can this method be employed on a Northern farm without a spread of the infection to the mature susceptible cattle?* In answer to this we can say that during the past three years, we have carried on tick infestation experiments at the College Farm and have had no spread of the infection from the experiment pens. A herd of forty or more dairy cattle have access to a pasture that is separated from the experiment pens by two fences with an interspace of only fifteen feet.

Careful observations on the movements of the mature and young ticks have been made ; and it has been found that mature female ticks travel only a few inches, if the grounds are such as afford hiding places, as a grassy pasture or plowed land. (On a smooth floor or hard packed smooth ground they will travel a long distance.) The young ticks were not found farther away than four feet from their hatching place in a grass plot. A quarantine space of fifteen feet seems therefore quite ample to check the infection. There is scarcely any stockbreeder who cannot find on his farm grounds convenient and safe for this work.

There remains a point yet to be settled ; namely, will the mild attacks of fever induced by an intermittent and graded tick infestation carried out in the cooler climate of the North fully immunize our Northern cattle against the fever when they are subjected to the heavier and continuous natural infestation, and the prolonged warm season that will be encountered at the South ? To settle this matter it is a part of our plan to ship to the South all of the cattle that have passed through these artificial infestations. And in order that a thorough test shall be made, we shall be guided by the advice of our Southern veterinary friends as to the proper time for shipment ; and shall leave to them the details of the exposure to be made at the South. We have ten head of infested cattle that are intended for this shipment.

Our work has been mainly with Jerseys ; and while we believe that the conclusions will hold good for the heavy beef breeds, we

would not advise the breeder of this class of cattle to employ this method until this point has been fully tested by the Experiment Stations. We are making arrangements to include in our further work a sufficient number of Herefords, Short-horns, Red-polls, and Galloways to determine definitely the value of this method for immunizing the beef breeds.

I am confident that the enterprising members of this Association, who are engaged in active practice in the cattle breeding districts of our country, will find profitable employment in aiding the stockbreeders to carry on this method of immunizing their fine cattle for the Southern market.

OUR MILK SUPPLY.

BY DR. CHAS. ELLIS, ST. LOUIS, MO.

The subject of pure and wholesome food is the problem of to-day. Milk constituting as it does, the principal food of the mammalia, particularly in infant life and being as it is a perfect food, renders it an important factor to civilization. From mankind down to the most insignificant species, it furnishes the life-giving and sustaining nourishment of the newly-born, and as it is the new-born of to-day who are the human beings and animals of tomorrow, it is of the most vital importance that they should receive proper nourishment at the start of life to enable them to develop into a perfect maturity, and after maturity to a life of usefulness.

With these facts before us, we are brought to realize the importance of a sanitary production and handling of milk ; milk that is pure, wholesome and absolutely free from disease.

Let us look at the source of our milk supply of to-day. Dairies are managed and operated with only one object in view, that is, the pecuniary benefits to their owners, regardless of the health and well-being of the public.

First let us examine the conditions of the average dairy located in cities. They have poorly lighted and poorly ventilated stables, containing about thirty cows, with an average of three hundred cubic feet of breathing space to each cow. Here the

cows are confined from the time they are bought until they are past usefulness, and are sold to the butcher. They are fed on distillery swill and brewery malt, mixed with an occasional bit of clover hay ; are not given any water, thus forcing them to drink the swill. They are allowed to lay in their own excrements without any bedding, thus becoming filthy, and are seldom, if ever groomed. These animals, coming from the country as they do, where they are accustomed to plenty of fresh air, exercise and grass, on being confined in such a stable, become feverish and sick for a time. Thus being debilitated they are susceptible to any disease, the germs of which lurk in such stables, and it is indeed probable that such stables are full of disease germs, from the fact of their being kept in such a condition favorable to their development.

The men and women who work in these dairies are, as a rule, filthy in themselves, and seem to have forgotten that "cleanliness is next to godliness." They think that the word "dairy" in itself means filth. As the cows are milked, the milk is emptied into open cans sitting in the stable, in which condition they remain until the process of milking is completed, thus absorbing the foul air and smells of the stable. The cans are then placed into cooling vats which are generally full of foul water and ice. It is milk produced in this manner that makes up the larger part of the milk supply of our city. The dairy located in the country is an improvement on those located in the city, in that the cows are pastured, consequently getting a bath every time it rains, and are fed on good, wholesome food. The milk is cooled in coolers, put in cans and shipped to the cities.

Milk that is handled by the large, so-called dairy companies, who receive their supply principally from the country, is also handled in an unsanitary manner. The milk is received from the roads in cans, placed in large cooling vats, the water of which is generally foul. Here it remains until the next morning, when it is distributed to their customers. Thus the consumer receives milk that is from one and one-half to two days old. It is here, we find milk that has been adulterated and treated with chemicals to keep it from souring.

Now that we have seen the stable and the conditions that exist, let us review the unsanitary conditions and see just what kind of food we could expect to receive from such a source. The cows of city dairies are from their treatment only milking machines, receiving no exercise, being kept in an unsanitary stable,

breathing foul air and eating stimulating distillery offal or slop, their sides and udders plastered with manure, particles of which fall into the vessel, while they are being milked. As a matter of course, the solid particles of manure are taken out of the milk by a process of straining, but can the soluble liquid be taken out? The open cans sitting in the stables absorbing the foul air and bad odors, and the vats in which the milk is cooled, all are nauseating. We have only to see this once, and we are convinced that milk produced in such a manner cannot be wholesome. Another source of infection is the washing and rinsing of cans. They are washed in dirty water, and are afterwards rinsed with water that is full of impurities.

That there are diseases communicable from the bovine to man needs no discussion and that tuberculosis stands at the head of this list will readily be admitted by all. Past investigation shows that an alarming per cent. of dairy cows are affected with this most dreaded disease, the existence of which is not readily detected by the ordinary methods. It is a difficult task to diagnose a case of tuberculosis in a cow by means of a physical examination. All praises be to Dr. Robert Koch for his valuable work and the discovery of tuberculin without which we would be groping about in the dark and grasping at imaginary straws.

The value of tuberculin as a diagnostic agent has not been overestimated. It is true that in some cases from causes unknown, animals may be tuberculous and yet not re-act, and in other cases, animals which are free from the disease may re-act to an injection of tuberculin. These failures are however a very small per cent. Here is where we meet with opposition; it is difficult to convince the dairyman that his cows, although they eat heartily and are sleek and fat and give the usual amount of milk are tuberculous, and they object strenuously to having their healthy cows, as they consider them, pumped full of a liquid they know nothing about.

There are other diseases to which the bovine is subject, such as Texas fever, anthrax and foot and mouth disease, which are likewise a source of danger, but they are diseases which are readily diagnosed and as a rule destroy the animal in a short time, consequently the danger to our milk supply is small.

"How shall we regulate and control our milk supply" is the question that is being discussed by all sanitarians and health authorities.

The subject of dilution was in former years the only one

considered, but we have now come to realize, that milk although diluted with about twenty per cent. of water, (if it be pure water) is only injurious to the pocketbook, but when it is the product of a diseased animal or has been infected with the germs of a disease, although it may contain the required amount of butter fat and solids, is dangerous to the health of the community.

The public are becoming aroused to the realization of this important fact and yet they are in part to blame for the existing conditions. Most people desire to purchase an article at the lowest possible cost, regardless of how it is produced. The average housewife prides herself upon the number of milk tickets she can buy for a dollar, consequently the dairyman, who endeavors to keep his dairy in a sanitary manner and keep his milk free from disease stands no better chance of selling his milk than the one who sets at naught all laws of hygiene. Thus we see that it is necessary to have strict laws regulating the production and handling of milk, and that they are rigidly enforced. Such laws should require cow stables to be built in a sanitary manner, allowing not less than twelve hundred cubic feet of breathing space, to each animal, with plenty of light and ventilation, and these stables should be kept scrupulously clean. The cows should be groomed and properly bedded and should be turned into pasture or have exercise every day. They should be fed on good, wholesome food and have plenty of pure water to drink. The milk house should be separate from the cow stable and so constructed that the walls, ceiling and floors can easily be cleaned. The cans should be carefully washed and rinsed, or better yet, thoroughly steamed. All animals used for dairy purposes should be thoroughly examined by a veterinary inspector, the tuberculin test applied and every suspected animal removed and slaughtered. No new cow should pass into the stable, without first being inspected and tested by the veterinarian. Here is an important field for the members of our profession and one that is productive of great good to humanity.

GROWING TUBERCLE BACILLI FOR TUBERCULIN.

BY C. A. CARY, B.S., D.V.M.

It is not the purpose of this article to project new ideas or discoveries but rather to make a few suggestions.

In order to make tuberculin one must first secure a pure culture of tubercle bacilli. This may be done by procuring a pure culture from some one who has it or by isolating the bacilli from a tuberculous animal or man. The latter method should be adopted, because the former leads to lazy habits and inexperience. Secure some fresh tuberculous sputum ; wash some of its solid or albuminous particles through six to ten changes of sterilized, distilled water ; inject one or more of these particles into the peritoneal sac of a guinea pig, a rabbit or a house mouse. In three or four weeks or before the animal dies, kill it, and from the spleen and liver carefully inoculate several of the ordinary blood serum tubes and of Löffler's blood serum mixture tubes ; keep these tubes in the incubator at 37.5 degrees C. and in 20 to 30 days the characteristic pure culture growth will be observed in some of the tubes ; some tubes may exhibit no growth and others may show growths of other germs.

A large stock of neutral glycerine bouillon should be kept on hand. It is best to make this bouillon from veal or with beef from an animal less than one year old. However, the most essential thing in preparing this bouillon is that it should be neutral in reaction. This is most accurately secured by titrating a .4 per cent. solution of sodium hydrate into 10 c.c. of the bouillon to which has been added a drop of an alcoholic solution of phenolphthalein. The 10 c.c. of the bouillon should be taken from the bouillon mixture after it has been heated and the coagulated albuminous materials have been removed by filtration. Then the delicate rose color, which indicates the neutral stage, will be readily observed. After making the calculation, neutralize the acidity in the bouillon by adding the proper quantity of an 8 per cent. solution of sodium hydrate. After neutralizing the bouillon should be cooked and filtered again.

This method was first used by Schultz and is described in full by Abbott in his Principles of Bacteriology.

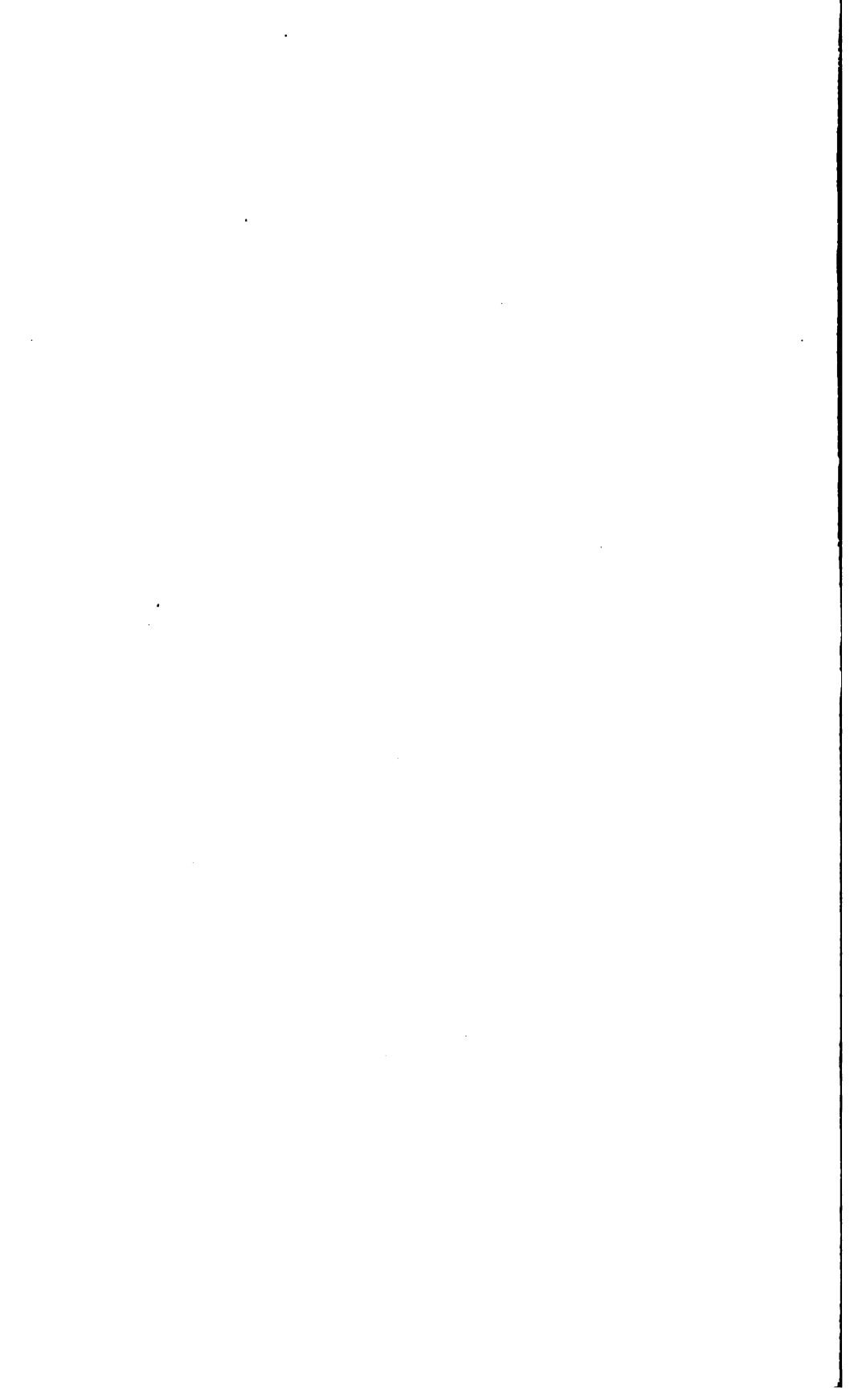
After the bouillon has been neutralized and sterilized, put it into large flat bottomed Erlenmeyer or antitoxine flasks, sterilize again and then inoculate with tubercle bacilli. Some authorities recommend floating a small quantity of the dry bacilli from an old agar agar culture upon the surface of the bouillon, but this is very difficult. I find that is just as efficient to take upon the platinum wire some of a moist growth of the tubercle bacilli and rub them over the inside surface of the flask on a level with the top or upper surface of the bouillon. It is best and easiest to inoculate a small Erlenmeyer flask of bouillon as suggested above and when a thin film has formed over the surface, small pieces of the film may be lifted out with a hooked platinum wire and they will readily float upon a bouillon surface.

After the cultures have grown at a temperature of 37.5 degrees F. for six or eight weeks, heat in steam sterilizer for fifteen minutes; run through sterilized filter paper, then pass it through a Pasteur Chamberlain air pressure filter or any good filter that will remove all of the germs.

The filtrate may be evaporated on a water bath to one-tenth of its original volume and the result will be the strong or concentrated form of tuberculin Kochii. This form keeps better or longer than any other.

One-half to one per cent. of carbolic acid may be added to the filtrate and the tuberculin will keep for some time. It will have the regular strength and be ready for use without requiring any changes.

To the filtrate may be added an equal quantity of pure glycerine, this will preserve it by preventing the growth of accidental infection, but will make it one-half as strong as the normal or regular tuberculin. This last method has not been tried sufficiently to warrant the writer in recommending it in preference to the well tried methods.



PROCEEDINGS
OF THE
SECOND ANNUAL MEETING
OF THE
UNITED STATES EXPERIMENT STATION
VETERINARY ASSOCIATION,
HELD AT
OMAHA, NEBRASKA, SEPTEMBER, 1898.

The Association of Experiment Station Veterinarians met at the Millard Hotel, Omaha on the afternoon and evening of September 8th, 1898. The Secretary desires to report a very enthusiastic and profitable meeting, all the papers being read and considerable business being transacted, of importance to the members. The members present were Drs. Connaway, Law, Cary, Nelson, Peters, Reynolds, Salmon, and Stalker. Visitors present were Drs. Merillat, Norton, and White.

The following new members were elected : Drs. S. S. Buckley of Maryland, Paul Fischer of Kansas, W. C. Langdon of North Dakota, and F. L. Russel of Maine.

Officers elected for the ensuing year are James Law, President, J. W. Connaway, Vice-President, A. T. Peters, Secretary-Treasurer. Members of the executive committee : M. Stalker, A. W. Bitting and M. H. Reynolds.

SECRETARY'S REPORT.

Members of the Association : As Secretary I feel gratified with the work done by the association, during the past year.

There has been more co-operation among the different Stations and more good feeling. The members have been very kind in replying to the communications. As there has been very little expense, and not having copies of the Constitution the Secretary has neglected to attend to the collection of dues, but printed copies of the Constitution and By-Laws have been sent to the members and to cover expense of the same the '97 dues are now payable.

The following changes have been made among the veterinarians of the various Experiment Stations: Dr. N. S. Mayo resigned from the Kansas Experiment Station at Manhattan and is now with the Station at Storrs, Connecticut, which place was vacated by Dr. G. A. Waterman, who is now with the Station at Lansing, Michigan. Dr. A. A. Grange having resigned from the Michigan Station is now connected with the Detroit College of Medicine in the Veterinary Department. The position vacated by Dr. S. B. Staples at Baton Rouge, Louisiana is now filled by Dr. W. H. Dalrymple. Dr. Paul Fischer is now located at Manhattan, Kansas, having taken the position vacated by Dr. Mayo. Dr. W. B. Niles resigned from the Iowa Agricultural College at Ames, Iowa, and Dr. J. A. Craig has taken his place.

FEEDING WILD PLANTS TO SHEEP.

BY S. B. NELSON, D.V.M.

For many years past there have occurred in the state of Washington, when sheep were being moved from winter quarters to summer pastures, serious losses in the flocks, according to the statements of the various sheep owners. These losses have occurred in certain definite localities in the spring, but not in the autumn when the sheep were returned to their winter feeding quarters. These fatalities happening under apparently the same conditions at the same time and place each year led the sheep owners to believe that the deaths were due to eating some grass or weed which acted as a poison to the sheep. This condition was brought to the attention of the Experiment Station and certain members commenced the work of investigating the cause of the great mortality in the flocks. As these experiments are not completed it is not the intention of this paper to discuss the cause of the death of the sheep but to record the results of feeding to sheep different plants many of which have been and are considered poisonous to sheep and other domesticated animals.

The Station Botanist went into these various localities and ascertained what plants were there. About thirty-five different plants were observed and as many as possible of these were fed and the results noted.

The plants found were grouped into two classes : 1st. Those from which might be expected a positive result. 2nd. Those from which a negative result might be looked for. Judgment being based upon public opinion expressed about many of the plants and also considering how abundantly the plants were distributed.

In the first class were : *Delphinium menziesii*, *castelleia pallescens*, *crepis barbiger*, *astragalus dorycrinoides*, *astragalus spaldingii*, *astragalus palousensis*, *zygadenus venenosus*, *frasera albicantes*, *antenaria luzuloides*, *sisyrinchium grandiflorum*, *arnica fulgens*.

Those in the second class were : *saxifrage integrifolia*, *lupinus ornatus*, *leptotaenia multifida*, *peucedanum grayi*, *synthyris rubra*,

clematis douglasii, *huechera glabella*, *lithosperma pilosum*, *geranium*, *potentilla*, *erigianum herachoides*, *geum trifolium*, *grindelia nana*, *chaenactis douglasii*.

The first and which was thought the most important was *delphinium menziesii*. Three sheep were used in this experiment. Prior to the experiment they had been kept in a lot where there was running water and they were fed timothy hay.

May 17th at 4:30 P. M., sheep No. 1, a ewe, was tethered in a patch where *delphinium* was very plentiful. She was returned to the stable at 8:30 P. M. There was evidence that she had eaten the blossoms of a few *delphinii*. The next morning she was placed in the patch at 5 A. M. and returned to the stable at 8 P. M. Besides the plants that she had cropped, there was given to her about one pound of gathered *delphinium* plants, which she ate. May 19th she was again tethered in the patch and given in addition to the amount she obtained there one pound of *delphinium*. This was repeated on May 20th, but she had only one-half pound of the gathered plant. She had however eaten everything within her reach except some scattered plants of *brodiae douglasii*. The following day she was staked out in a fresh place. She once in a while bites off the heads of the *delphinium* but does not seem to prefer it, however by evening she has eaten all the green material within reach of her tether, except the *brodiae douglasii*. May 22d she was tethered in a fresh place at 5:30 A. M. and by 9 A. M. she had eaten all the grass and *delphinium* within her reach. On the 23d and 24th she is all right. Here we have an experiment in which a sheep is kept tethered in a patch of *delphinium* for six days, and she eats all the plant that she can obtain and is fed two and one-half pounds besides with a negative result.

Experiment No. 2. This sheep was placed in a small pen and on May 18th was given five pounds of *delphinium*, consisting of stems, leaves, flowers and unripe pods. May 19th he has eaten all that was given him yesterday. May 20th. At noon gave him two and one-half pounds that was gathered on the 18th. Probably considerable of the plant's water had evaporated, how much I do not know. In two and one-half hours he had eaten nearly all of it and at this time was fed five pounds that had just been picked. The next day he had eaten all that had been given him the day before. Gave him three pounds that was partially dried. It had been picked twenty-four hours. Four hours later he had eaten the three pounds and was then given seven pounds

just gathered. May 22nd. Removed one and one-fourth pounds that he had not eaten. Gave him three and one-half pounds twenty-four hours old. Next day it is all eaten. May 24th and 25th. He is well and the experiment ended.

This sheep has been fed in five days, twenty-four and three-fourths pounds of delphinium, of which fifteen and three-fourths pounds were freshly gathered, six and one-half pounds twenty-four hours old, and two and one-half pounds forty-eight hours old. All this with a negative result. Certainly more of the plant than a sheep would possibly gather on the range in the same length of time. During these five days he has not had anything else to eat but had to subsist on delphinium.

Experiment No. 3. This was intended as a check on experiment No. 2, but this sheep did not eat the plant as readily. It consumed during the five days only six and one-fourth pounds. The result however was also negative.

These experiments certainly are strong evidence that delphinium menziesii, at least when eaten fresh at this time of the year is not poisonous to sheep.

CASTELLEIA PALLESCENS.

This plant was looked upon with distrust as being poisonous, as it occurs only in a few places in the state in abundance and it occurred where the sheep often died.

Two sheep were used in this experiment which began May 26th. Fed to the first one three-fourths pound of castalleia. The next day he has eaten only a little but gave him the same amount as yesterday in addition. May 28th. Only a little is eaten. May 29th. It is nearly all eaten. May 30th. It has all been consumed. In four days he has eaten one and one-half pounds of the plant.

May 30th the second sheep was fed two ounces of castalleia which he ate immediately.

The results of both of these experiments were negative.

CREPIS BARBIGERA.

We were informed by a party very much interested in this matter, that years ago he had seen crepis barbigera fed to sheep with fatal results, we therefore looked for positive results from these trials. Two sheep were used.

May 26th we fed to the first one two ounces of crepis. The next day he had not eaten all of it. May 28th. It is all eaten and he was given one-half pound which he ate by the following day.

June 23d. The second sheep was fed one and three-fourths pounds which he ate as if he relished it. Nothing detrimental to the sheep resulted from either experiment.

THE ASTRAGILI.

These plants have at various times been suspicioned of causing trouble in our domestic animals. We used the three following species: *astragalus spaldingii*, *a. palousensis*, *a. dorycrinoides*. Of *astragalus dorycrinoides* five and one-half ounces were fed May 26th. Of *a. spaldingii* twelve ounces were fed June 3d, and again to the same sheep was given one and one-fourth pounds on June 8th, five days later. June 9th two and one-half pounds of *a. palousensis* was fed to the third sheep. These sheep ate the various amounts given them during the night following without any ill effects resulting. Could these experiments have been continued for a longer period of time, it may be that pathological changes would have followed the continuous feeding.

ZYGADENUS VENENOSUS.

This plant is called "poison camas" by the Indians, and it is reported that the eating of the bulb of this plant has caused death in the human family.

During May 31st, June 1st and 2d, a sheep was fed one and one-half ounces daily. He would eat them from the hand with apparent relish. However his appetite was kept sharpened so that he would eat nearly anything. June 4th, fed to this same sheep one pound of the plant, which is both in blossom and fruit. This amount was all eaten during the night. The sheep remained well.

FRASERA ALBICAULIS.

Next was tried this beautiful plant, but only on one sheep. June 3d he was fed one and one-half pounds which he ate before he was seen the next day. June 5th fed to him five pounds, of which he ate about one-half during the night. By the 8th he had eaten nearly all. On this day fed him three-fourths of a pound

more, which was four days old. He ate this last amount during the night. In all he received seven and one-fourth pounds without any apparent injury to him.

SISYRINCHIUM GRANDIFLORUM.

The plants of this specie that were fed were four days old and about twenty of these stalks were fed. The sheep ate them out of the hand. Result negative.

ANTENARIA LUZULOIDES.

Three pounds were gathered and fed to one sheep. It was all eaten in less than twenty-four hours, without any visible bad results to the sheep.

ARNICA FULGENS.

This was the last plant in this class to be used. Fed to a sheep two pounds of the plant that had been gathered eighteen hours. The material was all eaten during the day. Result entirely negative.

This closed the experiments with those plants from which we had some reason to obtain some clearly visible physiological effects. There was fed of the different plants from one-eighth to seven pounds in one day.

In the second class the following were fed and eaten in about six hours time : *saxifrage integufolia*, seven ounces ; *leptotaenia multifida*, one and three-fourths pounds ; *grindelia nana*, two pounds ; *chaenactis douglasii*, one and one-third pounds. No poisonous symptoms followed.

LUPINUS.

May 30th. There was fed to a sheep one and one-fourth pounds at 11 A. M. At 6 P. M. it was all eaten. The next day gave him two and one-half pounds more which he ate greedily. June 1st that amount was doubled, giving him five pounds. This he consumed by the next day. This sheep was fed eight and one-fourth pounds in a few hours less than three days, from which no outward effects resulted.

PEUCEDANUM GRAYII.

On May 31st fed one and seven-eighth pounds of this stinking plant, having much doubt that the sheep would eat it. The fol-

lowing morning however it had all disappeared. Two days later fed him at one time four pounds which he ate by the following morning. The sheep showed no ill effects from it.

The following five plants were fed to five different sheep : *clenatis douglasii*, four pounds ; *lithospermum pilosum*, four pounds ; *geranium*, three and one-half pounds ; *potentilla*, four pounds ; *eriganum heracleoides*, three and one-half pounds. Each sheep ate his allowance in less time than one day and showed no ill effects whatever from it.

Of the next three plants a smaller amount was given : *synthyris rubra*, one pound ; *heuchera glabella*, one and one-half pounds ; *geum triflorum*, three-fourths pound. The sheep took nearly twenty-four hours to eat this and the result again was negative.

In this series of experiments from three-fourths to four pounds of the various plants were fed in one day without any appreciable effect on the sheep.

In conclusion I wish to acknowledge the valuable advice and assistance of the Station Botanist, C. V. Piper, in carrying on these experiments.

THE EXPERIMENT STATION VETERINARIAN AS A MEMBER OF THE STATE BOARD OF HEALTH.

M. H. REYNOLDS, D.V.M., M.D.

It is unfortunate that there is not greater uniformity in methods of controlling infectious diseases among domestic animals. Some states have adopted the plan of a state veterinarian assisted by local deputies, the state veterinarian having little or no connection with the State Board of Health ; while other states are trying to control infectious diseases among domestic animals through Boards of Live Stock Commissioners. Some states have a state veterinarian working on very meagre salary and other states have state veterinarians who are non-graduates and who are given considerable authority. And still other states are trying to control these diseases by means of official titles ; *i. e.*, they have

officers and titles but these officers are practically without funds and without sufficient authority. In Minnesota all police authority concerning infectious diseases of animals is vested in the State Board of Health. Until January 1, 1897, this board was composed exclusively of physicians. For a great many years Minnesota's State Board of Health presented the strange combination of a board composed exclusively of practitioners of human medicine, having absolute authority concerning infectious diseases of domestic animals. During this time the gentleman who held the position of Experiment Station Veterinarian was expected to visit outbreaks and accomplish marvelous things in the way of checking infectious diseases without any authority. This situation and the results of this method did not prove satisfactory to our stock interests. Stockmen made such vigorous objections during the winter and spring of '96 and '97 that the governor decided to appoint a veterinarian to membership on the State Board of Health. After due consideration he appointed the Experiment Station Veterinarian. This is the present situation in our state.

It is quite possible that another veterinarian may be appointed to membership on the board in the future, and then the work will be divided more nearly as it should be.

Our newly appointed member of the State Board of Health was soon made chairman of the committee on infectious diseases of animals and given immediate charge of the correspondence and general office work pertaining to infectious diseases of domestic animals. After about six months of this work he was made director of a newly created veterinary department. This divided the work of the board into three parts; that of the secretary and general executive officer, the bacteriological laboratory in charge of a director, and by the way we have a laboratory and bacteriologist in connection with this work in Minnesota of which we are proud, and the third is known as the veterinary department. Rules which partly define the duties and authority of the director of the veterinary department have been adopted as follows:

1. The Director of the veterinary department shall have the privilege of proposing such circulars and rules as he may deem necessary for the purpose of defining the policy of the board with reference to the veterinary work of the board. Such circulars and rules shall be submitted to the Executive Committee, or to the State Board of Health, for approval.

2. The Director shall conduct the correspondence dealing exclusively with veterinary matters. He shall have the neces-

sary police authority to enable him to order quarantine, when in his judgment such course shall become necessary. He shall have authority to use his judgment in releasing quarantine in unusual cases, independent of the rules governing quarantine.

3. All agents and employees doing veterinary work in the field, shall report to the Director and it shall be the duty of the Director to furnish the Secretary with such summaries of regular work and with such other information as the Secretary may need.

4. It shall be the duty of the Director to refer such matters as violation of the law dealing with infectious diseases of animals, general enforcement of said law, and indifference and carelessness of local health officers, to the Secretary for action.

5. It shall be the duty of the Field Veterinarian to investigate outbreaks of infectious diseases among domestic animals, when deemed advisable by the Director of the veterinary department, and to attend to such experimental and other veterinary work as may seem necessary. When not doing field work, it shall be his duty to assist the Director in correspondence and other office work.

6. The Field Veterinarian shall have authority to order quarantine, to kill and release quarantine of domestic animals, in accordance with the rules and recognized methods of the State Board of Health.

7. It is hereby declared the policy of the State Board to pay the salary and furnish transportation for the field veterinarian. Local boards are expected to pay all his other legitimate expenses incurred in work for them.

The work of the veterinary department has grown rapidly in all directions. During the last year we employed one Field Veterinarian. This spring we added another. Thus you see we have one veterinarian as a member of the State Board of Health and two others engaged in the field work of the Board. One of these field veterinarians devotes his entire time to hog cholera; the other does miscellaneous work, going to outbreaks of any disease of unusual importance; to outbreaks where there is dispute among different veterinarians who have been called by owners and local boards and to places in the state where there are no competent veterinarians.

Perhaps I should explain that in Minnesota we expect the local board to employ in ordinary cases a local veterinarian and take care of their own outbreaks of infectious diseases among domestic animals under the direction, of course, of the State

Board. The law requires that local health officers shall report to the State Board of Health within 24 hours after receiving information of an infectious disease.

During the four years of my work as an Experiment Station veterinarian before my connection with the State Board of Health, I was constantly crippled for lack of police authority. An Experiment Station veterinarian is usually expected to visit outbreaks, make diagnosis, and write prescriptions, and then he is severely blamed because the outbreak of glanders or anthrax, or possibly sheep scab, does not promptly abate. During this time I could give such information and advice, and write such prescriptions but had no authority to insist on anything. If I did this kind of work for the State Board of Health the Station received no credit.

On the other hand the State Board of Health veterinarian or state veterinarian, as the case may be, who has no connection with an Experiment Station, is very apt to be crippled for lack of opportunities and funds for investigation. For instance, he visits an outbreak of disease that affords a very peculiar and unusual history. The trouble may be due to faulty conditions of the feed, but he is unable to make a careful investigation and gather satisfactory information as to the cause and nature of the trouble, perhaps for lack of funds for such work.

An Experiment Station veterinarian, who is also a State Board of Health veterinarian or state veterinarian, has splendid opportunities for collecting materials, for doing a great variety of experimental work and keeping accurate records with very little expense to the Station. He can collect an abundance of material for almost any sort of experimental work, almost without expense to the Station. This is especially true if he has access to a well furnished bacteriological laboratory.

Another advantage is that such an arrangement brings about a hearty co-operation between two great institutions which might otherwise be working separately and more or less fruitlessly in the same field, each one's work incomplete without the data which the other could furnish. By the way, I might suggest that in Minnesota this plan of co-operation, especially in matters of agricultural interest is in quite general and happy operation. For instance, our State University, including our Agricultural College and School of Agriculture, our Experiment Station and State Farmers' Institutes are all intimately associated in their work, partly because the regents of the University and Experi-

ment Station are influential members on the Board of Control of the State Farmers' Institutes. Our State Fair grounds adjoin the Experimental Farm, and there is the closest possible co-operation between the State Agricultural Society, Minnesota Stock Breeders Association and the Experiment Station with its congeners: the College and School of Agriculture and the State Farmers' Institutes.

The Experiment Station veterinarian is also Director of the veterinary department of the State Board of Health.

We find co-operation between the veterinary work of the Experiment Station and the State Board of Health to be very satisfactory. We found the work unsatisfactory before such combination was made. So long as we had one authority in the state who had charge of infectious diseases, and another who worked in both parts of this field but had no police authority for infectious diseases, the work for each outbreak was more or less tangled.

Owing to the way in which the work is organized in Minnesota, outbreaks of infectious diseases among domestic animals are discovered and reported by the local health officer to the State Board. If the outbreak is such that it can be taken care of by the local health officer or by a representative of the State Board of Health, and all that is needed is a little police authority it does not necessarily involve the Station work at all. On the other hand if it is work that invites investigation, the Experiment Station furnishes materials and means for such work and finally if it is thought best, publishes and distributes its findings in a bulletin.

If representatives of the State Board of Health and Experiment Station go into the legislature together and ask for an appropriation or modification of existing laws they are apt to be successful.

Correspondence and other office work of the Veterinary Departments of the two institutions can be greatly economized by co-operation. There is needed only one set of office records and one official head for the two departments. Although there may be a large correspondence and an immense amount of office records and files to look after, the work can be so planned that one office assistant does this work for both. In our state the Experiment Station permits me to use a portion of my time for the State Board of Health work on the ground that I would have to do a great deal of this work whether connected with the State Board of Health or not. The office assistant and stenographer does all

my correspondence and keeps Station records although her salary is paid by the State Board of Health.

By this co-operation we avoid a great deal of duplicating which would otherwise be unavoidable, for instance, I write a small bulletin on hog cholera and swine plague for the Experiment Station. After it has been distributed by the Experiment Station I condense it into a small circular for use in the State Board of Health work.

Let me say in conclusion that I hope that the work of this Association may aid in bringing about greater uniformity, and closer co-operation between our various states, and when this work is organized as it should be every state will have one or more veterinarians on the State Board of Health, and the Station veterinarian will be *ex officio* a member of that Board.

LABORATORY RECORDS.

BY A. W. BITTING, D.V.M.

One of the first essentials in research work is the adoption of some system of keeping records. It matters little what system is used if it possesses the merit of convenience and clearness in giving the information desired. Some Stations have a common method of reporting for all departments. Some utilize blank forms which are filled out each day and filed. Others keep the records in books of uniform style while a few have no fixed method but trust to reporting each experiment by itself.

A method which commends itself to those who have used it, is the card index system, because of its adaptability to so many kinds of reports. It is the only convenient system that can be employed in keeping a bibliography of the special subjects under investigation. It requires but a few hours to catalogue all the articles in the veterinary journals each month and probably only a few minutes to index the special articles relating to the subjects under study. I undertook the task of making a complete index of all the English periodical veterinary literature. The journals indexed are The Veterinarian, The Veterinary Journal, The Edinburgh Veterinary Review, The Veterinary Record, The

American Veterinary Review, The Journal of Comparative Medicine, The Veterinary Magazine, and the Journal of Veterinary Science in India. The number of cards now in the index is over 50,000 and it will require about 12,000 more to bring the work up to the close of '98. While this index is of great convenience and value I could not recommend any one to attempt to duplicate it as the work is several times greater than is anticipated. If a few stations need such an index it would be far more economical to have a printed copy made from this one than to duplicate the work. I believe in general it will be found to be profitable to index only special subjects although all will admit the use and desirability of having a complete index. In making a bibliographical index the same style should be used as followed by public libraries.

The card index is the most convenient form of recording the presence and distribution of diseases in the state. The card should give the name of the disease, the locality, the time when reported, and the name of the person reporting it. The cards may be filed according to the disease reported or by counties to give the distribution.

The index is one of the best means for keeping a record of the equipment of the laboratory. The card should give the name of the article, of whom and when purchased, and the cost. When the article is broken or consumed the card can be removed and an inventory is always at hand. For recording staining reagents it should give the formula and date of preparation of each.

A card index serves as a convenient method of keeping certain laboratory notes. Examinations are frequently made of material out of the usual line of work and a brief record is all that is needed. Such a record upon a card can be filed and becomes useful at some future date when the subject may be under consideration. Reports of cases may be filed in the same way. As far as possible it is best to use the large index card and for recording laboratory examinations or cases, cards of usual height but double length.

THE DESIRABILITY OF CO-OPERATION BETWEEN
THE STATION VETERINARIANS AND
THE LOCAL VETERINARIAN
IN THE STATE.

BY A. W. BITTING, D.V.M.

It may be possible to imagine an experiment station so well equipped and so liberally provided with funds that the veterinarian at the head of his department can use his discretion in the selection of the disease or the special problem for investigation ; that he may go wherever the disease is present, stay as long as may be necessary to make a complete series of observations, or repeat his visitations until he has learned all that he can. In such a position, he could be independent of public demands, and could utilize all his energy in prosecuting his work.

A veterinarian occupying positions in a state experiment station is confronted with a different set of conditions. The funds for maintaining this department are limited. He is usually compelled to make his studies upon outbreaks of disease and such sporadic cases as occur in the immediate vicinity of the station. If he visits localities at some distance from the station, he is rarely permitted to have all the time that is necessary to complete the work or repeat his visitations because of exhaustion of the funds. Under the conditions existing at most of the stations the veterinarian can have at best only a small number of cases of any disease upon which to make observation or experiments. The public demands that he should be informed concerning the occurrence and distribution of contagious diseases and in many instances that he shall give assistance in their suppression. Of all the members of the station staff he is the least independent. He can not order an outbreak of disease for his special study, he cannot control the location or the duration of the disease when one does occur and he can obtain information upon the occurrence and distribution of contagious diseases in the state only through correspondence.

I believe the veterinary department of the experiment station and the veterinarians in the state should be on such friendly terms that co-operative work may be conducted to the advantage of both. The station can act as a medium to give the latest information upon the results of its own researches and announce the work that is being accomplished at other places. The station may also give assistance in diagnosis in certain cases where the microscope or other special equipment is necessary. The veterinarian in turn may be of great assistance to the station by reporting outbreaks of disease and the results of any experiments which he may undertake.

In 1896-7 I made an attempt to determine whether co-operation was practical and whether the station would gain information to compensate for the work required. There were ninety-six qualified veterinarians in the state. A circular letter setting forth the plans and blanks for reporting the number of cases occurring in their practice each month were sent to each veterinarian. The list of diseases upon which reports were desired were those most common in the state. It included abortion, (infectious) among mares and cows; actinomycosis; anthrax; cholera; glanders; influenza; rabies; specific ophthalmia among cattle; sporadic aphthae; tetanus; tuberculosis; azoturia; colic; other intestinal diseases; parturient apoplexy; periodic ophthalmia; pneumonia; cerebro-spinal-meningitis; bursatte; fistulæ; lameness; etc. At first I received about thirty-five replies but the number gradually became smaller and smaller until only eight remained after the month of August. In 1897, I tried a different plan and made my blanks upon postal cards and distributed them at the end of each month. I sent the postal cards to about twenty-five addresses and had fifteen reports for each month of the year. At the close of the year there was much greater interest than at the beginning and I feel certain that I could have doubled the number of correspondents. The work was abandoned as I contemplated withdrawing from station work.

The time covered by this work is admittedly too short to draw conclusions from the reports but they serve to indicate that certain diseases as tetanus and parturient apoplexy are of far more common occurrence than is generally suspected, that certain diseases as fistulæ and bursatte are common in some localities and rare in others and that seasonal influences are less marked than is often asserted. The station received fifty-one species of

parasites for identification and also a number of pathological specimens. At the suggestion of the writer several new preparations were used and reports received. The station supplied its own publications and gave notice of all bulletins upon veterinary science as they appeared at other stations and the Bureau of Animal Industry. Upon the whole the station was well repaid for its part of the work and the veterinarians expressed the desire to have it continued.

One of the good effects that was wholly foreign to the original object was the increased interest which it developed in the State Veterinary Medical Society. At the first three meetings of the Society which I attended only seven or eight members were present. The three meetings held after the correspondence was established was attended by from twenty-two to thirty members.

THE EXHIBIT OF THE UNITED STATES EXPERIMENT STATION VETERINARIANS AT THE PARIS EXPOSITION IN 1900.

BY A. T. PETERS, D.V.M.

Mr. President : I take pleasure in presenting to you a subject which ought to be of vital interest to every member of this Association, namely, the Veterinary exhibit of the United States Experiment Stations at the Paris Exposition in 1900. As is well known, at the convention of the Association of Agricultural Colleges and Experiment Stations held in July, 1897, at Minneapolis a committee upon a collective exhibit of the Experiment Stations at the Paris Exposition in 1900 was appointed, consisting of H. P. Armsby, M. A. Scovell, W. H. Jordan, A. W. Harris and A. C. True. The committee has had a meeting in conference with the Honorable James Wilson, Secretary of Agriculture and the Executive Committee of the above Association. As yet no appropriation has been made by Congress for such an exhibit, but the committee, as a result of their meeting have seen fit to proceed with the preliminary arrangements. Mr. Armsby has written me

regarding the exhibit of the Veterinary Department, and I have consented to bring the matter before this body for your careful consideration.

Mr. Armsby writes that "the committee desires to make in this exhibit a presentation of the origin, history and work of the Stations which shall be calculated to illustrate the essential and distinguishing features of the American system of Experiment Stations as compared with those of other countries. With this end in view it is proposed to make the exhibit technical rather than popular in its nature, appealing to the expert and the administrator rather than to the farmer. In carrying out this plan, it is the intention to make use of two methods :

First, it is intended to prepare a *report* which shall include a characterization of the work of the Experiment Stations along four main lines, namely : (a) Police or control work. (b) Studies of natural resources and conditions. (c) Demonstration on experiments. (d) Scientific investigations.

Second, based upon this report, it is desired also to make as attractive an exhibit as practical of selected typical examples of experimental methods and results."

I have given this matter no little study, and the more thought I spend upon it the more perplexing becomes the question as to how we veterinarians can best show the Old Country of our unique way of investigating scientific problems. I believe this question can be settled right here at the meeting of Experiment Station Veterinarians. And hence I have thought it advisable to offer this paper merely as an introduction to the discussion which I know you will enter into heartily. The committee desires not "a complete and exhaustive report upon our work," nor "a complete bibliography, but a characterization of the main lines and tendencies of our work, classified under the headings given above."

Concerning police and control work may be mentioned the work done by the Experiment Station Veterinarians in aiding the Bureau of Animal Industry in formulating the best methods of controlling contagious diseases by quarantine regulations and sanitary measures and vaccination. In this work what greater triumph have our foreign brethren scored, than we have in preventing the spread of Texas fever to the northern states, by the quarantine laws, and in successfully eradicating Pleuro-pneumonia in the United States, which latter fact will always be a source of great wonderment to foreign veterinarians, and which it will take scores of years for them to accomplish. Too much cannot be said in

regard to our work in eradicating sheep scab by the enforcement of sanitary measures and quarantine rules, when we consider how easy it is to spread unless the strictest laws are observed. Another thing that is characteristic of American Veterinarians is the work done by the different States in controlling tuberculosis and glanders by the extensive use of tuberculin and mallein, and the destruction of the diseased animals.

In demonstrating our experiments we will be able to show that they are original and unique, though not all have been successful, yet it must be admitted that a great per cent. have, and in fact a much larger per cent. than is publicly known. And even those that have failed have in a way been stepping stones to higher scientific investigations. The Veterinarians abroad who are unfamiliar with what we have done, and who have given us credit for so little, can, if we take advantage of this opportunity, be shown that our work ranks as high as theirs. This latter fact has never been conceded by them, but we must remember that the investigations and experiments of our Veterinarians do not date back so far as do those of European investigators and hence it becomes our opportunity to illustrate to them that our work of recent years compares surprisingly favorable with theirs. Personally I believe that along certain lines, our investigations even exceed those of our foreign brethren. To back this up I should like to call attention to American investigations in Texas Fever as compared with the German investigations in Wildseuche and Buffelseuche, which are supposed to be the same as Texas Fever.

Besides these researches which have resulted in the discovery of the real cause of Texas Fever, the movements of the little tick, and the best methods of treatment and prevention, let me call attention to the work of the Bureau of Animal Industry and Experiment Stations in investigating Hog Cholera, in which this country is undoubtedly foremost. As much may be said concerning Actinomycosis and many other diseases too numerous to mention here.

Gentlemen, I have pointed to you only a few of the many distinguishing features that go to characterize the work of the United States Experiment Station Veterinarians, and I am therefore in hopes that these few words of introduction will aid in bringing out from the members just how and what we ought to exhibit before foreign veterinarians.

The idea of the committee is to demonstrate in the report the characteristic investigations along the lines of the various dis-

eases for which each Station is noted. This should be prepared in a technical concise manner, yet simple and practical enough to prove that no nation on earth has done more along these lines in recent years than has the United States. For instance this report should contain an outline of the work done together with the results in the separate states, including police and control work, and laboratory and field investigations and experiments.

The exhibit accompanying said report should consist of apparatus, specimens, statistics and all materials used, thus making the report more practical and illustrative than otherwise.

To make such a showing possible, and in order to do justice to the United States Experiment Stations, it will require your entire co-operation in the matter, and allow me in closing to express the hope that you will each and every one enter heartily in assisting the committee to gather the material necessary to make the venture a success.

PROCEEDINGS
OF THE
FIFTH ANNUAL MEETING
OF THE
ASSOCIATION OF VETERINARY FACULTIES
OF NORTH AMERICA,
HELD AT
OMAHA, NEBRASKA, 1898.

MILLARD'S HOTEL, SEPTEMBER 7, 1898.

The fifth annual meeting of the Association of Veterinary Faculties of North America convened at the Millard Hotel, Omaha, Nebraska, at five o'clock P. M., September 7th, 1898, President Pearson in the chair and the various colleges represented as follows :

American Veterinary College—R. R. Bell.
University of Pennsylvania—Leonard Pearson.
Columbian University—D. E. Salmon.
McKillip Veterinary College—L. A. Merillat.
N. Y. State Veterinary College—J. Law, W. L. Williams.
Iowa State College of Agriculture and Mechanical Arts—
M. Stalker.
United States College of Veterinary Surgeons—C. Barnwell
Robinson.
Kansas City Veterinary College—Sesco Stewart.
Chicago Veterinary College—A. H. Baker.

Drs. Hoskins, Clement, and Kelly, representing the Pennsylvania, Maryland, and New York Examining Boards respectively, were also present.

On motion of Dr. Robinson, the proposed amendments to Arts. I and II were adopted. (Vide Proc. U. S. V. M. A., 1897, page 225.)

Dr. James Law, Dean of the New York State Veterinary College, presented a paper upon "The Co-operation of the Various Examining Boards and the Desirability of Establishing an Interstate Examining Board the Certificate of which would be accepted by the Boards of all States," as his contribution to the report of a special committee of which he was a member (see Rep. U. S. V. M. A., 1897, page 224). Dr. A. W. Clement also contributed a paper on the topic and Drs. Hoskins, Clement, Baker, Robinson, Kelly, Pearson, Stewart, Stalker, Salmon and Merillat joined in the discussion.

Officers were elected for the ensuing year as follows :

President Dr. M. Stalker ; Secretary and Treasurer, Dr. L. A. Merillat, both nominees being unanimously elected.

Adjourned.

R. R. BELL,

Secretary, *pro tem.*

PAPERS PRESENTED AT THE FIFTH ANNUAL
MEETING OF THE ASSOCIATION OF
VETERINARY FACULTIES.

THE CO-OPERATION OF THE VARIOUS EXAMINING BOARDS AND
THE DESIRABILITY OF ESTABLISHING AN INTERSTATE EX-
AMINING BOARD THE CERTIFICATE OF WHICH WOULD BE
ACCEPTED BY THE BOARDS OF ALL STATES.

BY JAMES LAW.

Only in recent years has there been instituted in any of the United States legislation controlling the practice of medicine or veterinary medicine. Wherever such legislation has been secured it has been at the instance of the practitioners. In assuming credit for the advantages secured by such legislation we must also take whatever blame may be justly charged upon those who inspired the laws in question. That the laws regulating veterinary medicine are beneficial none of us will seek to deny : that there are objectionable things incident to the working of these laws many have felt. That the advantages far exceed the disadvantages we will all agree. We can have no desire to go back to the days of anarchy in medical or veterinary practice.

The question then is mainly what objectionable features is it possible for us to get rid of without sacrificing the indispensable advantages ?

Among the grievances which attach to the working of the State law regulating the practice of veterinary medicine, the following are prominent :

1st. It impairs the sense of unity of the veterinary profession. This is a very serious drawback but it cannot be claimed that the law in question is its only factor of causation. The same estrangement existed before, among the graduates of the different schools, and in enlarging the clan or clique from the school to

the state, the Statute has taken a step in the right direction, and done much to unify the body of practitioners within the limits of the Commonwealth. To this extent therefore the Statute makes for unity as against sectionalism.

2d. It interferes with interstate practice. The prosperous city practitioner, whose clients have largely gone to the seaside, wishes to spend his own vacation at a watering place in another state, and incidentally to continue his practice among his own city clients abroad, and among others. But he is debarred by the statute. To this matter there are two sides. The city practitioner wishes to accommodate his client, and the client prefers his trusted city adviser. He can secure him by visit, for the Statute usually recognizes and authorizes consultations with practitioners from outside the state. This is expensive and disadvantageous but it can be done. On the other hand there is the local practitioner, who serves the watering place during the dull season, but who sees his practice and living absorbed by this well-to-do city practitioner during his natural harvest time. He may well claim that the law which protects his competitor in the wealthy city, should be respected by him in the seaside town. Is it not better that the interloper should be compelled to qualify in the state which he has adopted for his summer residence, than that the law should be nullified and all its beneficial provisions set at naught?

3d. A prospective student cannot choose his school for the advantages it offers him, irrespective of the demands of the state in which he proposes to practice.

The supposed grievance here is more specious than substantial. It is open to the student to secure his education in any school, and afterward to go before the board of examiners of the state in which he proposes to practice, instead of that of the state in which he was educated. He must, of course, see to it that he enters a school which maintains a standard high enough to be recognized and registered, by the examining board of the state of his prospective adoption. We cannot for a moment advocate the acceptance of a certificate of education in a school giving a two years' course, as equivalent to the three years demanded by the statute, we cannot suggest the acceptance of a five months academic year, if the law demands a year of nine months, and we can not recommend that the board of a state which demands a high matriculation examination, shall condone the absence or legal insufficiency of this preliminary examination. The grievance of

the prospective student is therefore by no means so great as it appears and by a little foresight and judicious inquiry he can easily prepare himself for practice in the state of his choice. There is really nothing in his supposed claim or grievance that deserves a moment's consideration apart from the desire to be allowed to practice in a given state, on the basis of preparatory work and accomplishments below those demanded by the laws of that state, and enforced on the other practitioners in that state.

Such a claim (that an alien should be admitted on a lower requirement than the citizen is so utterly preposterous that to simply state it is to put it out of court.

4th. The most serious grievance and the only tenable one is that of the new graduate who has not decided upon a location in which to practice but who receives encouragement to settle in another state than the one in which he has received his degree and his license to practice. With him may be classed the old practitioner who wishes for any reason to move from one state into another, and who does not care at his age to face an examination. Here there is some appearance of hardship but after all it is more in seeming than in reality. A particular state has enacted in its statutes that no one shall be henceforth licensed to practice within her borders who is not possessed of certain definite qualifications. Our aggrieved student, if he had any expectation or aspiration to practice in that state should have entered a school in which he would have been furnished with these qualifications. In seeking his education through an easier channel he deliberately excluded himself from the right to practice in that state. Who is to blame? And who should be called upon to correct the fault? If the state must admit him on qualifications that are below the standard required by its statute, it introduces an incomparably greater evil. It does wrong to every law-abiding veterinarian in the state who entered on practice by complying with the prescribed standard. It offers a premium to the under educated alien who is not law-abiding, at the expense of the educated citizen who is law-abiding. It fosters the low class school provided it is outside its own limits, at the expense of the school of a higher class within its limits. It certifies to the stock owners of the commonwealth that they can trust their live stock, as safely in the hands of a man educated in a neighboring state to a low standard, as in those of the man educated at home up to the legal standard. If the state is to admit to practice the under educated alien, it should begin by cutting down the require-

ments demanded of its citizens in its home schools. In a case like this every step taken by the state for the relief of the alien, who is not up to the state requirement, is a lowering of the standard of veterinary education. It is a direct infringement of the law, and this in favor of a degradation of the profession. This should not be countenanced by such a body as this.

Even in the case of the old practitioner it is very questionable whether the law of higher requirement can be set aside with safety. In securing the various state laws regulating veterinary practice, it became necessary to admit to license to practice all practitioners of several years' standing, even those without a degree and in too many cases without education, and these men are entitled to all the privileges of the educated veterinarian within the commonwealth. But an adjacent state is under no such obligation, and if this uneducated practitioner desires to move into such other state, it would be poor policy to certify to his qualifications by granting a license, unless he shall have complied with the requirements of the state of his adoption.

The laws regulating veterinary practice usually contain a clause by which a definite number of years of reputable practice may be accepted as the equivalent of a college course, or even of the matriculation requirements. But they should not, and our New York law does not, allow that this shall stand in place of an examination for license. To secure a great future good a state may wisely endorse for the time an old established and temporary wrong which has established a vested right.

But no such consideration should warrant the uncalled for introduction of such wrong into a neighboring commonwealth.

If the state imposes such a barrier against the entrance of the nongraduate practitioner from the neighboring state, is it not equally called upon to admit the graduate practitioner only under the required test? It may well be argued that the experienced graduate practitioner who has not kept himself in such relation to the literature of his profession as to enable him to pass easily such an examination as is given for license is not a desirable acquisition. It may also be claimed that the admission of the old practitioner without test, into a state which subjects all new graduates to a very searching test and a high standard, may prove a bid for the introduction of mediocrity or inefficiency, which the state thereby endorses and commends to its stock owners. The old practitioner who cannot hold his own against the competitor fresh from even the poorest schools, may sell out and moving into

a state in which the standard is higher, may start with all the false plumage which the state endorsement can give him. I do not wish to commit myself irrevocably on this question of the graduate practitioner, but with my present light I am quite satisfied with the New York state law which requires examination as a prerequisite to license.

Having thus cleared the field somewhat of questions involved we may enquire how far can the different state licensing authorities reciprocate by accepting the results of the examinations made of each other?

In facing this question, we must conclude what is just and proper, or what is admissible, rather than what is at present legal. Yet there are certain leading constitutional requirements which cannot be overstepped. We cannot secure a national examining nor licensing board which can have any authority in the individual state. We can have no conglomerate private board (composed of representatives of the different states) which can exercise any authority within their several boundaries.

Congress cannot impose such a board upon the individual state for the administration of its internal government. It is difficult to see how such an examining or licensing body can be of any value in conferring an authoritative degree or license which may have the force of law in the different states.

If it were possible to have each member of such examining or licensing body appointed in each state independently as a state official, it would I believe be proper to recognize their action as the action of each state and as binding within its limits.

To give this arrangement the color of legitimacy the candidates for places on the board would have to be elected by the great body of veterinarians throughout the land. It would then be representative and carry a moral weight which it could not attain to if nominated or created by a small select body like the United States Veterinary Medical Association from which the expense of active membership excludes the great body of practicing veterinarians.

An arrangement of this kind would at once develop that organic unity of the whole profession in the United States, which has been one of its greatest desiderata up to the present. It would beget an *esprit de corps* and a sense of individual responsibility and power which do much to elevate, reform and ennoble the profession.

Among drawbacks to such a proposal may be named the neces-

sity that the board in question should sit in each state for the examination of candidates, for although their decisions made in one state might be considered valid in another, yet it is manifestly impracticable to have the candidates for graduation assemble from all the states, at one grand rendezvous. The men of California and Maine could not be compelled to attend in Kansas City, nor the New York and Philadelphia men in San Francisco. There would be resulting difficulties at every step. The examining board would be so frequently on the move from one part of the country to the other that they could not well maintain home practice, and their remuneration and the expenses of their frequent long journeys could not be met by examination fees, but must be provided for in some other way. In short with all its advantages, this plan of a national examining board is far from being an ideal one, and reduced to practice would prove unwieldy, awkward and virtually impracticable.

It entails besides the adoption of the very provision the absence of which stands in the way of the mutual acceptance in each state of the license given by every other state: The adoption, namely, of an uniform standard of veterinary education for all states alike. This is a *sine qua non* to any acceptable or successful system and, if once this is adopted, we will do well to abandon any unnecessary machinery and have the licensing boards of the different states accept as equivalents the examinations made by the official boards of sister states.

THE ONLY POSSIBLE UNIFORM REQUIREMENT.

This brings us back to the question: What standard of education can be adopted by all? The only standard which can be universally accepted is the highest that is demanded by statute in any one state. No state can righteously admit to practice, a man from a school outside its borders at a lower standard than it demands of the graduate of the school within its domain. Without further argument, therefore, any accepted uniform standard must be the highest standard maintained by any one state. Deny this and you deny the possibility of obtaining any national board and any standard or license that will be universally acceptable.

By the adoption of a lower standard you would not only set a limit to all future advancement of the profession, but you would demand a retreat from the best standard which is already in force.

As representatives of the veterinary teachers of America we can not give our voices for a compulsory lowering of the standard

of any state. If all states and schools are prepared to elevate their requirements to the level of the highest now in force, the adoption of reciprocity as regards the examinations and licenses of different states is simple and just. But if all are not prepared to rise to the highest existing standard, such general reciprocity becomes impossible, and an alternative course must be devised and adopted.

RECIPROCITY OF STATES HAVING THE SAME STANDARD.

I can see only one satisfactory way of reaching such an alternative : namely for those states which have the same or equivalent standards to adopt a system of reciprocity among themselves to the exclusion of all those which maintain a lower standard. We might thus have two, three or four standards for as many different groups of states. The licenses to practice issued by standard No. 1. (the highest) would then be accepted all over the United States, but no licenses under standards 2, 3 or 4 would render the holder eligible to practice in the states which held to the standard No. 1.

The licenses to practice issued according to standard No. 2 (the second grade) would admit to practice in all states adhering to standard No. 2, and to 3 and 4 as well, but not to the states maintaining standard No. 1, and so on through the different grades of 3 and 4.

This principle is simple, and equitable ; it requires no machinery and no expense that is not already provided for in every state which maintains a legal standard at all ; it should and would be acceptable to every fair minded man in the profession and out of it.

The student can find no fault, for just as he knows that he can practice nowhere without a degree, he will also know that to practice in a given state he must have a degree of the grade which that state demands, and he must enter a school which will raise him to that grade. The practitioner can find no fault for not only will he have the right to move into a state which maintains the standard demanded in his own, or into any one satisfied with a lower standard, but he can also enter one which maintains higher grade by passing the examination imposed.

The schools should be placated since those which prefer the shorter and cheaper course will cater for such students as prefer to confine their practice to the states having the lower standard,

while those that give the longer and more thorough course will cater for those who aspire to practice in states that maintain the higher standard, or who wish to secure the right to practice in any state which offers the best prospect. Each school will reap the advantage of the special standard it may adopt: the shorter and less thorough one attracting the larger numbers, who cannot afford the means nor time to pursue the more extended course, while the school with a more extended and elaborate curriculum, will look for those only who can afford this, and who hope to secure the prospective privileges and advantages.

Everyone will know definitely where he stands, and there will be no ground for the current complaint of the short course men that they are not admitted to the privileges secured by the long course, and no excuse for exclusion by the licensing board of one state of the licensees of a neighboring state which maintains higher requirements, until the second state will accept the licenses granted by the first on a lower requirement.

CONCLUSION.

In conclusion, I can see no way of reaching a satisfactory system of reciprocity of state examinations and licenses through the cumbrous machinery of a national board of examiners. The satisfactory operation of such a board can only be secured by raising the requirements of all states to the highest existing standard. If this uniform elevation of the standard to the highest present requirement can be secured the national examining board will be rendered unnecessary as the different state licenses should thus become interchangeable. So long as a certain number of states are unprepared to adopt the highest existing requirements, the only alternative is to group the states according to their standards, and let there be reciprocity of license among the states of any given group, and acceptance of their licenses by all states holding to a lower requirement.

BY A. W. CLEMENT.

The subject for discussion to-day: "The co-operation of the various Examining Boards and the desirability of establishing an Interstate Examining Board whose certificate would be accepted

by the Boards of the various States'' is one of vast importance and one which must be looked at from many standpoints before arriving at a definite conclusion. In the first place the laws of the different states must be uniform ; the standard of questions must be the same, and a definite schedule for practical and clinical examinations must be established. A purely written examination will not suffice, neither should it measure the abilities of the different applicants.

Of course in the present condition of affairs more or less of the examination must be written, but at best, this form is but the relic of barbarism in past ages. With our present system of education, certainly the schools should be able to turn out men fitted to pass examinations in the laboratory and in the stable.

There is no excuse in my mind why every school which pretends to give a good theoretical and practical course should not compel its students before graduating them to obtain the necessary standard for practical work and for Laboratory research. Such, however, has not been the experience of the Board of Examiners in Maryland. Men who pass creditable or fairly creditable written examinations as the case may be, utterly lack the information when guaged by their abilities in the stable or in the Laboratory. Therefore I believe that if the schools persist in giving to the students this purely theoretical schoolboy information they should be compelled by the Examining Boards to devote more time to the practical questions of the day. In other words instead of cramming students with a lot of purely text book information which they can better obtain themselves by reading, the minds of the students should be better trained in powers of observation, and in a rational deduction from such observation. To come then more directly to the subject of this paper, I say yes, there is a great desirability of establishing an Interstate Examining Board whose certificate would be accepted by the Boards of all States. *But* we should be very careful in selecting the Board to have them represent the best thought of the profession, Men who are if possible as well prepared or equipped for their work as are the schools for teaching. First of all I again say that the laws governing the practice in the different states must be the same or very similar, or the Board must take for its minimum the laws governing the practice in such State or States as we now know or believe to be the best. Certainly such a Board should not aim to give such questions to an applicant as they cannot answer themselves. It is very easy to puzzle and confuse an applicant by giving him

catch questions, such as would appear to have been the object of certain Examining Boards. It is not however asking too much of a student that he be able to diagnose certain simple cases, to give his reasons therefor and he should certainly be able to examine horses for soundness, to tell the general breeding of such horses, cattle and dogs as may be placed before him. I would suggest that the laws governing practice be reduced to one clause, namely, that all applicants before being allowed to register should graduate from a school requiring at least three years' course of study, and should pass such examinations as may be required of them.

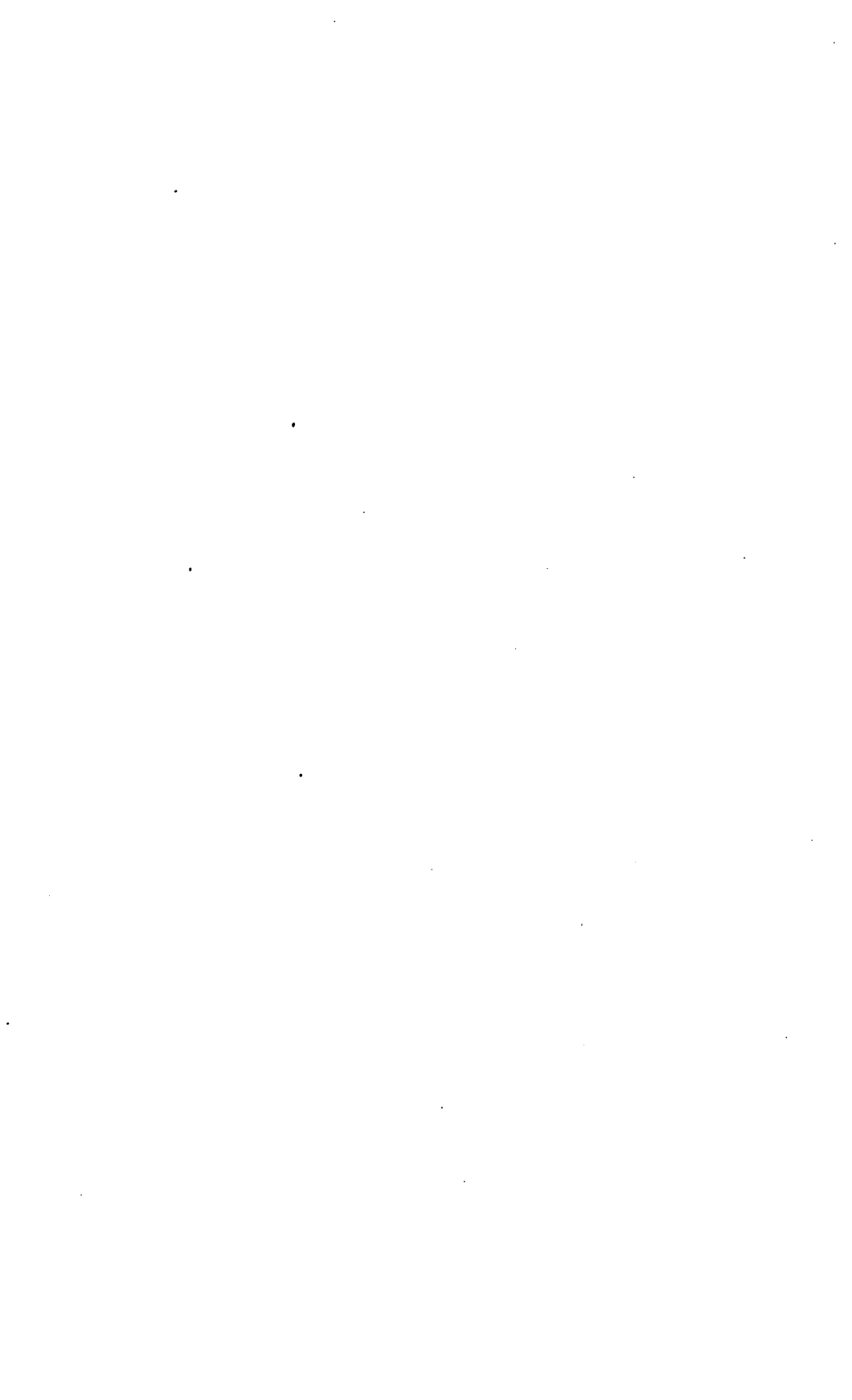
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